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## THE INTERPRETATION OF SOCIOMETRIC STATUS SCORES IN THE CLASSROOM

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During the last twenty years sociometric methods of investigating peer evaluation status have been increasingly used in a variety of situations: among other things, there have been many educational, industrial and military applications (11, 12). The general procedure has, as we all know, an attractive simplicity: the subject is required to express his desire to interact with certain individuals as well as his desire to avoid interaction with certain other individuals. A simple measure of sociometric status is then obtained by adding together the choices an individual receives from the members of the group, whereafter it is possible to differentiate relatively super-selected and relatively sub-selected from the more normally selected individuals. This measure of sociometric status has been used in a variety of ways with different degrees of interpretation. Broadly speaking, we may identify two main uses: (a) a more *restricted* (or *test-proximal*) use, and (b) a more *interpretative* (or *test-distal*) use (cf. 4). In the former case the measure is regarded only as a condensation of incoming pal-preferences without much interpretation being added; the status of being sub-selected or super-selected may then be compared with other individual data. In the latter case, which is perhaps more frequent, the measure of sociometric status is given one or several extra-operational interpretations, i. e. a translation is made to a more general language, more distant from the *here and now* of the specific choice situation. One or several assumptions are then made – often unconsciously – concerning the sociometric status score.

It is very often held, for instance, that the overchosen individual is not only overaccepted in the specific choice-situation from which the status score was derived, but also that he should retain his relative position if we used slightly different preference methods or different choice aspects or different test times. Moreover, sometimes the state of being overchosen is thought of as combined with awareness of the fact of acceptance: the subjects *feel* accepted. Further, overacceptance is thought to be combined with good “adjustment” and “efficiency” in general; having high status is regarded as desirable, having low status as not desirable.<sup>1</sup> The use of the

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1. Cf. the concept of “*sociometric bonity*” of position and locomotion as illustrated in the “chess-board sociogram” (1, pp. 252-254).

measure in different countries in this broad interpretative meaning presupposes intercultural similarity. Briefly, the sociometric status score is often assumed to be

- (a) relatively *unaffected by primary preference method*;
- (b) relatively *unaffected by choice aspect* (criterion);
- (c) relatively *constant over time*;
- (d) accompanied by individual *awareness* of own relative sociometric situation;
- (e) *correlated with* measures of general *adjustment* and *efficiency* of the individual; and
- (f) possible to *interpret similarly in different countries*.

The aim of the present discussion is to try to make us aware of such interpretative assumptions; to discuss some ways of testing these assumptions; and, finally, to contribute to such an undertaking by means of data obtained in a Swedish investigation of sociometric status in school classes. Data clearly related to certain of these points are already available in the existing literature; it seems, however, too time-consuming to discuss in detail correspondencies and non-correspondencies between our investigations and earlier work.

### SUBJECTS AND PRIMARY STATUS MEASURE

On the whole our investigations, from which only certain sub-projects will be discussed here, may be said to consist of two different but closely connected parts: (a) One *intra-sociometric* investigation of 867 children divided into 30 classrooms (5 classrooms on each of the six age levels 9-14 years). For some of the questions considered here only part of this population is relevant. (b) One *extra-sociometric* investigation with intensive analyses of about 140 extreme sociometric types (*super-selected vs. super-rejected*) chosen with the aid of the sociometric technique. These investigations, in turn, consist of two sub-parts: one *intra-individual* analysis (using self-ratings in questionnaires and ratings by peers and teachers as well as objective test data); and one *inter-individual analysis* (using observations of interaction behavior).

The starting point for our discussion is taken in the sociometric status scores earned in a work-mate selecting situation. The pupils were given the opportunity to choose co-workers with whom to work in a group at school. They also had the possibility of indicating if there were some pupils they would *not* like to have as co-workers. (For further details of data collection, cf. 7).



## RESULTS

Our first task is to discuss the three assumptions concerning the specificity of the status scores. To what degree are results from our choice situation limited to the method of preference (simple choices unlimited in the upward direction), to the choice aspect (choice of co-workers), and finally, to the specific test moment? Or, conversely, to what degree are generalizations (test-distal "translations" or predictions) possible and admissible? We will take one assumption at a time.

*The non-specificity of the method of preference.*

Whereas American sociometrists nearly always use simple choices, and one European research tradition (cf. 8, 9, 14 etc., and the discussion in 6) has favoured the method of rank order, comparisons between several methods are relatively rare (cf. 13). In two school classes I used the following five preference methods: (A) *the method of simple choice* unlimited in the upward direction; (B) *the method of pair comparison*; (C) *the method of rank order*; (D) *rating scale method I*, where the subject was given lists of names followed by the +++ ? --- sequence; and (E) *rating scale method II*, also using a 5-step scale, but this time constructed like Bogardus' distance scale (with phrases such as "may be a member of a two-pupil work-group", "may be a member of a four-pupil work-group" etc., to the most negative one: "should rather be out of our class"). - In all cases the choice aspect (work-mate) was held constant.

Except for the last method - where negative choice aspects were most clearly involved - the intercorrelations between the different methods were

Table 1. Intercorrelations between Status Scores According to Five Different Methods of Preference ( $r$ ).

Method	B	C	D	E
A. Simple choice	.83	.85	.79	.87
	.75	.65	.70	.37
B. Pair comparison		.94	.95	.92
		.94	.91	.29
C. Rank order			.95	.93
			.91	.70
D. Rating scale I				.93
				.26
E. Rating scale II				

Two coefficients are given for each comparison: the first refers to a class of 28 girls (Class I), the second to a class of 30 boys (Class II).

Table 2. A Comparison ( $r$ ) between Status Scores Founded on Unlimited Choices and Different Degrees of Post-Experimental Limitation (using a standard score combination of methods B-E as a criterion variable).

Choice possibilities	Weighted choices		Unweighted choices	
	Class I (N 28)	Class II (N 30)	Class I (N 28)	Class II (N 30)
Unlimited	.85	.77	.86	.80
5 choices	.80	.76	.79	.75
4 choices	.80	.77	.78	.78
3 choices	.79	.72	.80	.69
2 choices	.75	.70	.75	.68
1 choice	.60	.60	.59	.61

Unweighted choices: the sum of choices received. Weighted choices: the sum of choice values received, whereby a first choice was given a value of 4, a second choice a value of 3, a third choice a value of 2, and all other choices a value of 1.

moderately high: most of them between .70 and .95 (Table 1). Although there is by no means a one-to-one correspondence, we seem to have no reason to assume that results achieved with one of these methods should be fundamentally different from results found with other methods. (Besides, some decrease of correlations may be due to real instabilities in preference, since we had to insert an approximate two-week interval between the different tests in order not to bore the subjects). Methods B-D seem to be somewhat more closely interrelated to each other than they are to our main method A, which may depend on different inclusiveness. However, even if methods B-D are thus to be recommended in some respects, there are several reasons for not discarding the conventional simple choice method: this is usually felt to be more meaningful by the subjects, and it may be used also for other aims (e. g. measuring the expansivity of the subject). – Using a standard score combination of methods B-E as a criterion variable, sociometric status scores founded on our unlimited choices and different degrees of post-experimental limitation were compared (Table 2). It was seen that unlimited choices corresponded somewhat better with the criterion variable, but also that the differences between unlimited and moderately limited choice situations were very small, so that such a limitation for certain purposes may be said to be a satisfactory approximation.

*The non-specificity of the choice aspect: an inter-aspectual comparison.*

The next assumption deals with the non-specificity of the choice aspect. To what degree do we find similarities between different choice aspects, and to what degree do we find differences? The greater the similarities, the

Table 3. Interspectual Differentiation: Correlation between the Number of Choices Received for Two Different Choice Aspects ("Work-Mate" and "Friend").

Age level	N	r	Age level	N	r
9	27	.87	12	26	.86
	30	.74		25	.66
	38	.88		37	.84
	31	.85		27	.74
	28	.92		31	.78
10	34	.89	13	26	.89
	33	.88		25	.71
	34	.89		30	.58
	31	.72		30	.83
	32	.67		29	.71
11	23	.82	14	19	.75
	26	.87		23	.77
	32	.89		24	.68
	31	.86		30	.81
	32	.91		21	.49
9-11		.84	12-14		.74

Values from 30 classrooms are given – 5 classrooms on each of the 6 age levels 9-14 years. Age levels are approximate (corresponding to the Swedish elementary school grades 3-8).

less aspect-bound the socio-preferential differentiation and the greater the possibility of generalizations (translations, predictions). Avoiding details, we may summarize the results in two points: (a) Preferential status seems to be relatively general at this age (9-14 years), so that friendship choices, work-mate choices and schoolyard companion choices give similar status rankings, and thus it is not impossible to "translate" from one preference situation to another. (b) At the same time we perceive a slight tendency towards greater differentiation so that such generalizations may be said to be somewhat less risky among the younger pupils than among the older ones (cf. Table 3).

#### *The non-specificity of the test moment.*

Our next problem deals with the temporal specificity. To what degree do we find intertemporal consistency? Correlations between status scores before and after a 4-month interval average .82, before and after a 13-month interval .73 (Table 4). Although we see some tendencies towards

Table 4. The Stability ( $r$ ) of Received Work-Mate Choices in Three Classes Studied Longitudinally.

Class	4-month interval		9-month interval		13-month interval	
	$N$	$r$	$N$	$r$	$N$	$r$
A	37	.91	34	.84	33	.83
B	31	.82	31	.79	28	.80
C	30	.72	29	.53	27	.55
$M$		.82		.72		.73

All classes included both boys and girls. At the first test the pupils in class A were about 9 years, in class B about 10 years, and in class C about 11 years.

less consistency the longer the time interval, we find a fair degree of stability over relatively long periods (cf. Table 5).

In cases where we from the specific test-moment may make predictions of changes to come, the specificity of the moment is diminished *in spite of* changes. In order to make such predictions it may be of some use to interpret the choice attitudes as tendencies to locomotion, and thereby to translate the static choice structure into a sociodynamic network of field forces in Kurt Lewin's sense (cf. 10). Two examples of general predictions may be made: (a) If different levels of choice are thought to represent different degrees of strength of field forces, first choices should be more constant than second choices, and so on. (b) If an incoming choice is interpreted as a contributing force when it has the same quality as the outgoing choice, but as a restraining force when it has the opposite quality, a rejection given a positive reciprocation should have a greater tendency to shift than a rejection given a negative reciprocation. Both the assumed tendencies have empirical foundations in the present investigation (Tables 5 & 6).

#### *Awareness of choice-reception and status.*

The pupils have at least a partial awareness of their choice-senders (62 % of first choices were correctly perceived and reported using a guessing technique similar to that of Tagiuri; cf. 15). There seems also to be a fairly general knowledge of which pupils are most chosen. – However, another question, more directly relevant to the problem at issue here, is: are the overchosen and overrejected individuals aware of their positions; do the overrejected children *feel* rejected more often than the overchosen? This seems to be a very important question, which must be considered as a basis for the hypothesis of more general maladjustment in the case of the overrejected individual. Some information might be derived from a self-



Table 5. The Constancy of Different Preference Levels.

(The percentage of retained positive preferences irrespective of second-time preference level: total values for classes A, B and C, cf. Table 4).

Preference level	4-month interval	9-month interval	13-month interval
1st choice	81.7	75.5	68.2
2nd choice	72.3	71.3	55.7
3rd choice	68.3	61.7	54.5
4th choice etc.	49.7	43.5	41.5

Table 6. Reversal of Negative Choices at Different Degrees of Sociodynamic Balance Within the Dyad.

## a) Definition of Three Dyadic Rejection Patterns.

Kind of definition	Pattern number		
	1	2	3
A.1. Testproximal choice terms	$x$ rejects $y$ , and $y$ rejects $x$	$x$ rejects $y$ , and $y$ is indifferent towards $x$	$x$ rejects $y$ , but $y$ chooses $x$
A.2. Testproximal choice symbols	$x\bar{N}y$	$xNIy$	$xNP_y$
B.1. Testdistal vector terms (from the point of view of $x$ )	One actual force is acting on $x$ in the direction away from $y$ , and one potential force is acting on $x$ in the same direction.	A force is acting on $x$ in the direction away from $y$ .	One actual force is acting on $x$ in the direction away from $y$ , and one potential force is acting on $x$ in the opposite direction, which is most simply expressed as a potentially restraining force against $x$ 's tendency to move away from $y$ .
B.2. Testdistal vector symbols (from the point of view of $x$ )	$\bar{f}_{x,-y}$	$f_{x,-y}$	$(rf)_{x,-y}$

For further details of testproximal and testdistal symbolization in sociometric analysis and for the concept of "potential force", see references 2 and 3.

Table 6. Continued.

b) *Empirical Choice Reversals in Retesting.*

Interval	Dyadic pattern	Percentage choice reversal	Number of rejections
4 months	1	4.2	24
	2	14.0	107
	3	22.6	31
9 months	1	4.2	24
	2	11.4	105
	3	26.5	34
13 months	1	12.5	16
	2	23.7	76
	3	24.0	25
Total	1	6.3	64
	2	15.6	288
	3	24.4	90

The subjects are the same as in Table 4. – Although small, all differences go in the expected direction (i. e. the lowest percentage of choice reversal among the first type of dyadic pattern, the highest among the third).

report device such as the California Test of Personality, which was given to our groups of 68 overchosen and 68 overrejected pupils. Although the character of non-objectivity is inherent in all self-report instruments, we cannot say that they are always without interest. On the contrary, when we deal with personal and social adjustment, self-perception seems to be of direct interest in spite of or rather *by virtue of* its subjectivity. Do the underchosen perceive and describe themselves as dissatisfied? With respect to total test scores we get very clear and significant differences between the two sociometric categories (Table 7). Thus there is not only a difference in sociometric adjustment operationally defined from the choice situation, but also with respect to subjectively perceived adjustment. If we investigate which are the best differentiating items, we find that many of them directly refer to the perception of rejection: "Do you often think that nobody likes you?" – "Do your classmates often quarrel with you?" – "Do your classmates choose you as often as they should when they play games?" –

Table 7. Sociometric Adjustment and Self-Perceived Adjustment. California Test of Personality.

Score type	Sex	Mean score values		P
		superselected	superrejected	
Part I	M	53.5	44.5	.02
	F	52.5	47.0	.02
Part II	M	47.3	40.0	.007
	F	47.3	45.0	.2
Total	M	100.8	84.5	.002
	F	99.8	92.0	.02

*Subjects:* The number of pupils was 136 (34 superselected boys + 34 superselected girls + 34 superrejected boys + 34 superrejected girls). They were selected from 17 school classes: the two most chosen boys, the two most chosen girls, the two most rejected boys, and the two most rejected girls from each class (24 children from each of the 5 age levels 9-13 years and 16 children from the 14 year level). Where rejections were too few, the least chosen pupils were selected instead of the most rejected.

*Test material:* A Swedish translation of California Test of Personality - Elementary Series was used, in which the twelfth section (Community Relations) was excluded because of less relevance.

*Data treatment:* The significance of the differences is expressed in *P*-values, which have been estimated from four-field tables with the aid of chi-square calculations with correction for continuity.

#### *Correlation between measures of sociometric status and measures of general adjustment and efficiency.*

It may be a reasonable hypothesis that the much chosen display socially more desirable behavior than the little chosen. From the co-worker, for example, we demand both efficiency in interpersonal communication and efficiency in results produced. Information about such extra-sociometric correlations may be found in our investigations of superselected and superrejected pupils; in their self-reports, in ratings of them, or from observations of their behavior in objective test situations.

Ratings by peers were made with a guess-who device centering around social positivity, extrovert social activity, and work efficiency (cf. 5). The pal-description rating status was found to correlate significantly with sociometric status, which confirms the view presented above that the choice-situation is not too specific: the two modes of subjective rating are intimately related and may for some purposes be considered only as different aspects of a complex pal-evaluation totality. - As a basis for the teacher rating, the Haggerty-Olson-Wickman Behavior Rating Schedules were used. It was seen that the superrejected pupils were described by the

Table 8. Extra-Sociometric Correlates. Ratings by Peers and Teachers.

Score type	Sex	Mean score values		<i>P</i>
		superselected	superrejected	
Peer rating, "positivity"	M	25.3	6.8	<.001
	F	25.1	8.0	<.001
Peer rating, "negativity"	M	5.7	21.1	<.001
	F	6.3	19.2	<.001
Teacher rating, behavior problems	M	13.8	54.4	<.001
	F	8.9	41.1	<.001
Teacher rating, intellectual aspects of behavior	M	12.7	21.0	<.001
	F	12.4	19.7	<.001
Teacher rating, physical aspects of behavior	M	11.7	16.9	<.001
	F	12.9	16.1	<.001
Teacher rating, social aspects of behavior	M	16.6	25.1	<.001
	F	16.3	23.3	<.001
Teacher rating, emotional aspects of behavior	M	17.3	28.0	<.001
	F	17.1	26.1	<.001

Subjects and data treatment the same as in Table 7.

teachers as children with behavior problems and with such intellectual, physical and emotional characteristics as are found among children with problem tendencies. — Of course, both teachers and pals give subjective views influenced by general attitudes; nevertheless, their descriptions confirm each other (Table 8).

The data from the objective tests in several respects corroborate the self-rating and other-rating data (Table 9). Intelligence tests (we used one American non-verbal and one Swedish verbal group test) showed a clear difference between the two extreme groups — the superselected pupils having the better test result. With respect to general and physical achievement according to school marks the superrejected children were, as a rule,



Table 9. Extra-Sociometric Correlates. Objective Test Data.

Score type	Sex	Mean score values		<i>P</i>
		superselected	superrejected	
Intelligence test: verbal (Siegvald)	M	19.4	13.4	.007
	F	17.8	14.6	.03
Intelligence test: non-verbal (Cattell)	M	111.0	90.1	.02
	F	113.8	91.0	.002
Perseveration test: alternation task	M	19.6	20.7	.002
	F	19.7	19.8	.2
Fluency test: word categories	M	28.1	21.6	.01
	F	26.7	24.0	>.3
Suggestibility test: Body Sway, final period	M	2.30	3.36	.2
	F	1.86	2.36	.01
Honesty test: cheating (problem solving)	M	1.45	1.70	>.3
	F	1.09	2.12	.02
Honesty test: lying (books read)	M	1.70	2.61	>.3
	F	0.70	2.27	.2
Tree Test: primitivities	M	0.47	1.06	>.3
	F	0.50	0.91	.09
Color Pyramid Test: structural symmetry	M	0.91	0.65	>.3
	F	0.68	0.15	.08

Subjects and data treatment the same as in Table 7.

inferior (Table 10). The superselected pupils showed some tendency towards lower perseveration in alternation tests and less suggestibility in the Body Sway Test. The rejected, on the other hand, tended to be less fluent. Honesty being important in social interplay, a few simple situational tests

Table 10. Extra-Sociometric Correlates. School Achievement.

Score type	Sex	Mean score values		<i>P</i>
		superselected	superrejected	
General achievement	M	15.18	11.41	.002
	F	14.75	11.75	.03
Physical achievement	M	1.65	1.33	.002
	F	1.58	1.35	.04

Subjects and data treatment the same as in Table 7. – With correction for age in the calculation of the general achievement scores (justified because of the often slightly changing scale of marks) the *P*-values will be  $<.001$ . If we give younger and older children separate treatment, we find the following *P*-values: Boys 9-11 years  $<.001$ , girls 9-11 years .003, boys 12-14 years .05, girls 12-14 years .02.

Table 11. Extra-Sociometric Correlates. Observation of Group Work Behavior.

Score type	Age level	Sex	Mean score values		<i>P</i>
			superselected	superrejected	
Attitudes towards co-workers	9-11	M	20.3	15.2	$<.001$
		F	19.6	15.0	.004
	12-14	M	18.9	16.3	.04
		F	20.3	15.9	.001
Attitudes towards work	9-11	M	24.3	13.3	$<.001$
		F	25.3	15.8	.004
	12-14	M	24.0	18.6	.2
		F	23.8	17.5	.004
Attitudes towards the own person	9-11	M	18.8	14.9	.001
		F	17.1	15.1	.07
	12-14	M	17.6	15.7	.003
		F	17.5	15.9	.03

*Subjects:* 144 pupils selected similarly as in Table 7 (24 children from each of the 6 age levels 9-14 years).

*Observation and scoring procedure:* Each child was observed for four five-minute periods. The behavior record for a single five-minute period was translated into a seven-step scale for each variable according to explicit principles, whereafter the different period scores were added together. Thus, the resulting score for a single variable may lie between 4 and 28. Details of recording and scoring principles will be given elsewhere (cf. 7). – The *P*-values have been estimated as in Table 7.

of cheating and lying were used; the rejected pupils showed most often the undesirable behavior. Tree Test Primitivities as well as Color Pyramid Test Structural Primitivities tended to be less frequent among the superselected children.

Observation of group work behavior at school (Table 11) showed that negative attitudes towards the work, towards the co-workers, and towards one's own person ("I-cannot reaction") were more frequent among the superrejected pupils. There was some indication that these differences were not so clear among the older children as among the younger ones, which was also the case with respect to school marks and intelligence tests.

#### *Intercultural similarity.*

A recent article by Thorpe (16) shows very remarkable correspondence with respect to results from extra-sociometric correlations in Great Britain and the U. S. A. In comparable aspects, our Swedish results show fundamental similarities with these Anglo-Saxon reports; and this seems to be a further indication of a certain intercultural translatability.

### CONCLUSION

Briefly, we may conclude: In our investigations we have found a fair amount of non-specificity with respect to methods, choice aspects, and test moments. In addition, a certain awareness of received status, and clear extra-sociometric correlations with respect to general adjustment and efficiency were noticeable. It is obvious that such facts add to our feeling that sociometric status scores are useful. On the other hand, we very seldom have the possibility of perfect predictions; we usually have to consider disturbing variables. On the whole, there seems to be a persistent need critically to discuss the specificity of different choice situations and the assumed correlations with extra-sociometric variables. The *sine qua non*, however, is that we ourselves are conscious of the assumptions underlying our different interpretations. Only then have we the possibility of testing them, and only then are we able to make effective use of the sociometric technique.

### SUMMARY

Several interpretative assumptions are often made implicitly when using the results from sociometric choice-situations in education. It is often tacitly presupposed, for instance, that the sociometric status score is (a) relatively unaffected by primary preference method; (b) relatively unaffected by choice aspect (criterion); (c) relatively constant over time; (d) accompanied by individual awareness of the own relative sociometric situation; (e) correlated with measures of general adjustment and effi-

ciency of the single individual; and (f) possible to interpret similarly in different countries. – These assumptions are discussed and confronted with data obtained in an investigation of Swedish school children.

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# DISCRIMINATION OF HUE AS A FUNCTION OF WAVE LENGTH

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## INTRODUCTION AND PROBLEM

In a previous investigation (1) five color factors were extracted from the matrix of subjective similarities between fourteen spectral colors. When the factor loadings were plotted against wave length, they closely resembled the curves of relative excitability of nervous elements in the retina, which have been obtained by Granit (3, 4).

In a recent paper (2) it was shown that our five color curves could be adequately represented by the normal frequency function. As a further test of this hypothesis we inferred from the fitted normal curves a similarity matrix for the 91 possible combinations of our spectral colors. The correlation between this matrix and the experimental similarity matrix was + .98. The agreement between the data of the similarity analysis and the values of the normal probability function is illustrated in the linear plot of Fig. 1 below.

It is the purpose of this paper to show that the discriminatory ability of the normal observer with regard to wave length may be predicted from our five normal color curves.

## PREDICTION OF DIFFERENTIAL THRESHOLDS

The linear physical continuum of wave length is represented in sensation by a curvilinear continuum in five dimensions. In passing, it may be noted that there is an interesting point-to-point correspondence between these two continua. This is one instance of how we perceptually transform physical stimulation into a mathematical model which is different from, but strictly related to, the former.

So far we have been concerned only with supraliminal intervals, and our experimental data are of this kind. Our purpose, however, is to predict just noticeable differences. This prediction must rest upon the assumption that a jnd is a constant fraction of the wave length interval which, in that range, corresponds to the arbitrary unit of the subjective scale. In other words, in a part of the spectrum where the subjective change is rapid, the jnd is small, etc.

This investigation was made possible by a grant from The Swedish Medical Research Council. The writer is indebted to Mr. B. Dahlbäck for computational assistance.

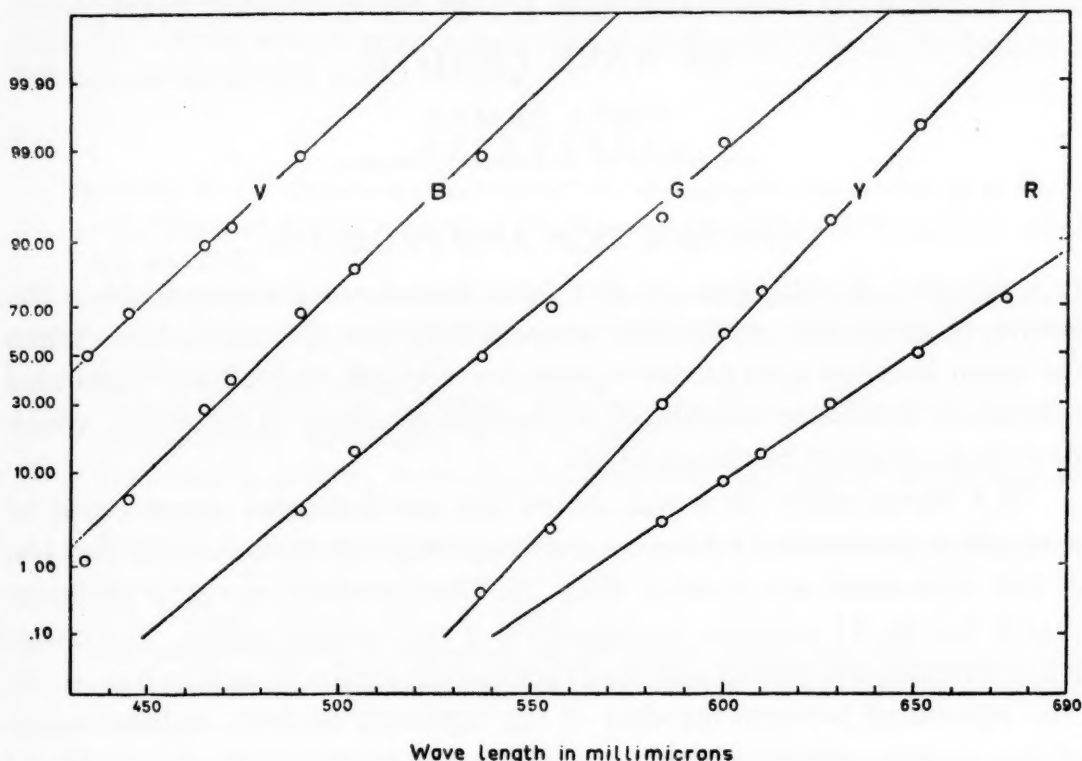


Fig. 1.

This may be a plausible assumption but it is not self-evident. It may, in fact, imply an important psychological principle which has not been recognized before in the case of qualitative or multidimensional variation.

We have estimated from the five normal curves the similarities between any two successive wave lengths separated by ten millimicrons. On the assumption stated above, these similarities are proportional to jnd's. The curve in the upper part of Fig. 2 shows the values obtained.

#### COMPARISON WITH EXPERIMENTAL DATA

This curve is to be compared with data from experiments concerned directly with discrimination of wave length. Some representative curves are shown in the lower parts of Fig. 2. They are drawn from the data of Steindler (6), Jones (5), and Wright & Pitt (7). Steindler's data from twelve subjects have been averaged by Jones (5).

The general agreement of our predictions with the experimental data is obvious. There is a disagreement with the data of Wright and Pitt, but this disagreement is shared by other experiments on jnd's. In general, our curve is as similar to any of the jnd curves as is any of these to the other curves of the same group.

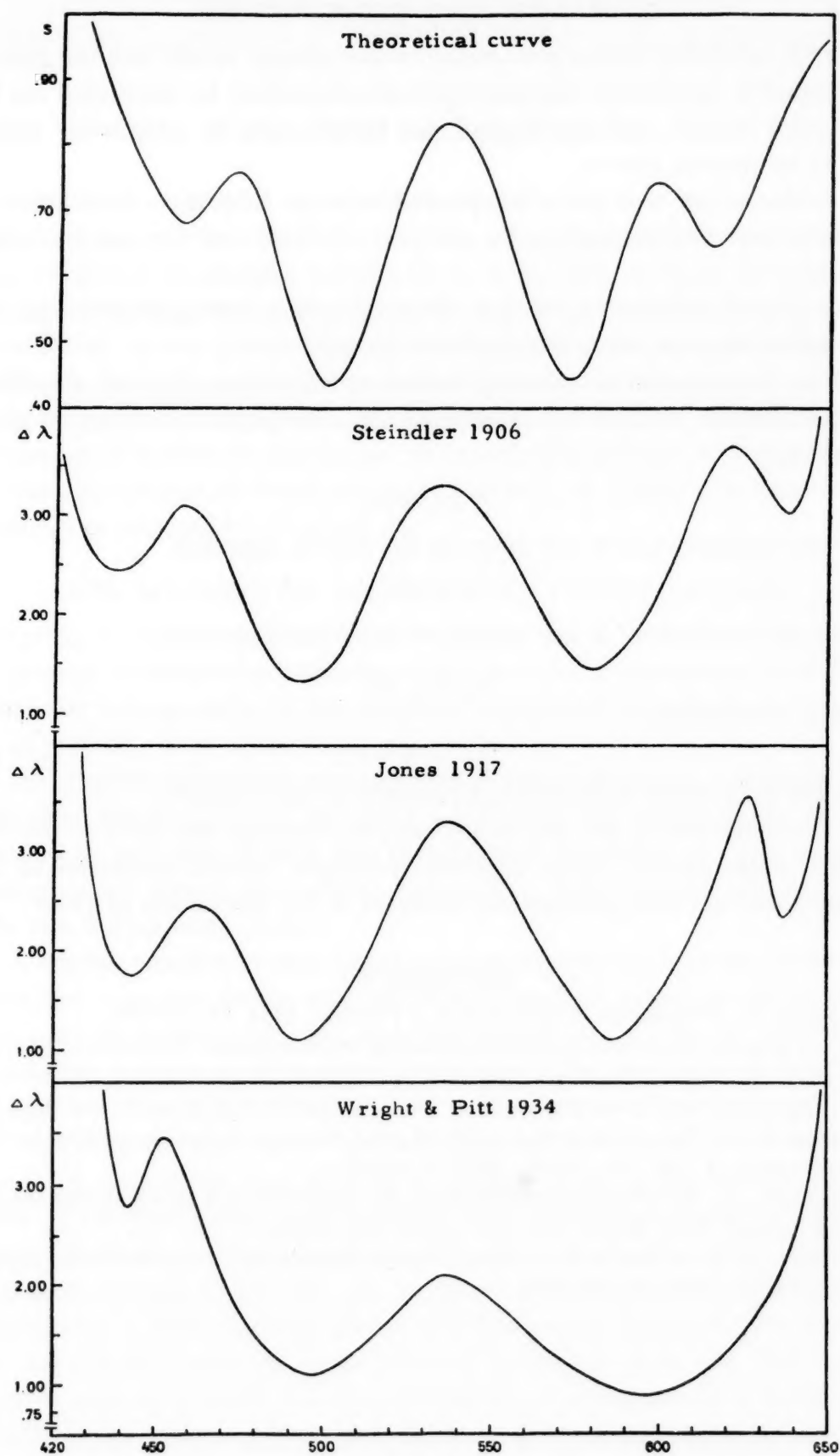


Fig. 2.

## SUMMARY AND CONCLUSIONS

1. It has been shown previously by the present writer that the matrix of subjective similarities between spectral colors may be accounted for by five color factors, and that these color factors may be adequately represented by normal curves.

2. Assuming that jnd's are proportional to subjective similarities in supraliminal comparisons, jnd's are inferred from our five normal color curves.

3. The theoretical curve thus obtained is in good agreement with experimental data on wave length discrimination.

The psychophysical relations under consideration may be described mathematically. The jnd is proportional to the subjective similarity, in small intervals,

$$\Delta \lambda = \phi(s)$$

and the similarity scores are given by the matrix equation

$$S = YY',$$

where the elements of  $Y$  are ordinates of five normal curves.

$$y_i = f_i(\lambda).$$

Hence, in principle

$$\Delta \lambda = \psi(\lambda),$$

i. e., the differential threshold is a function of wave length.

The constants of this somewhat complex function are those of the five normal color curves. These constants represent certain properties of the sensory and nervous mechanisms involved in the perception of color.

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# THE VELOCITY OF THE MOTION AFTER-EFFECT

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There have been several experimental attempts made to measure the apparent velocity of the cumulative motion after-effect (MAE) and to study it as a function of stimulus velocity (2, 3, 8, 9). The technical devices employed, however, were more or less inadequate and results have proved inconsistent, as was pointed out by Wohlgenuth in his extensive study of MAE (9). Even the method which Wohlgenuth himself applied must be characterized as rather crude and unsatisfactory. Koffka has summarized the divergent results by stating that MAE-velocity changes with the stimulus velocity but not in direct proportion to it (7, p. 1204). The same conclusion was reached by Dimmick (4).

## THE METHOD OF INTERMITTENT STIMULATION

The purpose of the experiment reported here was to state the relationship in question, in terms of quantitative data and under experimental conditions where the various kinds of bias ascribed to previous investigations had, as far as possible, been eliminated.

After some preliminary methodological experimentation, we developed a method which seems to be rather suitable for the investigation of our problem. It will also afford a new possibility of obtaining an exact quantification of the figural after-effect. This aspect of the method will be dealt with in a forthcoming paper.

A crucial problem in after-effect measurements is to keep the degree of "satiation" constant during measurement. (The term satiation will be used here only as a technical term denoting effects of iterated or prolonged stimulation and has no theoretical implication.) The intensity of the effect changes with the time subsequent to the interruption of stimulation.

This problem was solved by a technique of alternation between short phases of stimulation and after-effect phases. First, a pre-stimulation of about 20 sec. guarantees good satiation. Then stimulation is interrupted for a moment which is long enough to make the AE clearly perceptible, but also short enough to prevent any fading of the effect. This AE-phase is followed by a short stimulus phase, which abruptly "cuts off" the MAE, and this stimulus phase is again followed by an AE-phase etc. This technique results in a vivid and forceful MAE, experienced as a backward motion of the stimulus. Its short duration gives it the character of real

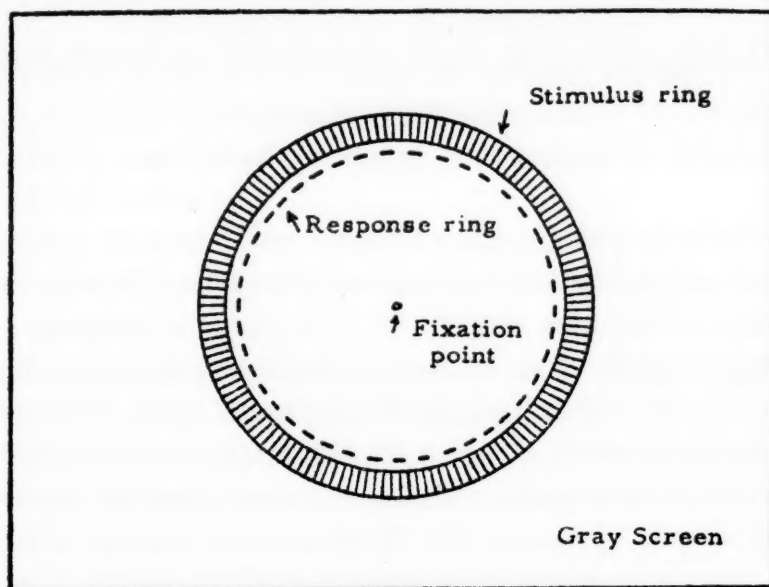


Fig. 1. The display with the movable stimulus and response rings.

motion since there is no conflict between displacement and localization, and thus the stimulus appears to move to and fro.

At the very instant when the stimulation is interrupted, a "response" object on the display, near to the stimulus, starts to move.

This response motion has the same direction as the MAE, and its velocity can be adjusted by the S. It stops when the stimulus object starts again. A display with circular motions was most appropriate for such a device, and it is demonstrated in Fig. 1.

The task set the Ss is to fixate the fixation mark, to keep passive during the phases of stimulation and successively to adjust the "response" velocity during a series of after-effect phases, till it is perceived as equal to the MAE velocity.

### APPARATUS

An apparatus specially constructed for MAE-investigations is described in an unpublished paper (6). This apparatus was modified to suit our present purpose. Deviations from our previous description, due to this modification, consist essentially in a duplication of the driving set and stimulus disc. Two display discs are fitted on the same shaft and each is operated by its own driving set. In this way, we obtain mutually independent motions of both the stimulus ring and the response ring in our display (Fig. 1).

The two driving sets are regulated by a common timer, which makes it possible to obtain the exact alternation of motion required for our method.

When one motion stops the other is simultaneously released. The stimulus ring moves for two seconds and the response ring for one second. The directions of the motion of the two rings are opposite, and the motions are absolutely uniform. There are no velocity changes or rebound effects when the motions start and stop.

We found a stimulation phase of 2 sec. and an after-effect and measurement phase of 1 sec. most convenient for our present purpose. At this frequency the interruptions in the velocity judgements, which the stimulus phases represent for the Ss, do not seriously interfere with the judgements. The Ss often use these interruptions for turning on the velocity adjustment knob. This is probably due to the fact that at this frequency (.33 cycles/sec.) the whole cycle falls within the span of the psychological present.

The response ring is driven by a gramophone motor with a centrifugal governor. The speed of this motor can be adjusted by turning a knob in front of the display.

The display of the apparatus is shown in Fig. 1. The homogeneous background is gray, the discs with the stimulus and response rings are white, and the lines are drawn with black india ink. The inner diameter of the stimulus ring is 270 mm, the radial lines of which it is composed are 35 mm long and the distance between them is  $1^\circ$ . The diameter of the response ring is 250 mm. A chinrest is fixed 100 cm from the display, and in this way the distance between the eye and the stimulus is kept constant. By means of this arrangement and when fixating the centre point the inner rim of the stimulus ring falls within a circle a  $7^\circ 40'$  radially from the centre of fovea.

### PROCEDURE

The experiment was carried out in a more systematic way with seven Ss. Six of them had had previous experience of psychological experiments.

Five steps in stimulus velocity were tested: 1, 2, 4, 8, 16 degrees of rotation per sec. ( $1^\circ$  of rotation on the display =  $8.9'$  visual angle). The velocity  $16^\circ/\text{sec.}$ , however, was given only to three Ss.

Velocity adjustment was obtained by means of an unrestricted matching procedure. The S was free to manipulate the knob for the adjustment of the response velocity till he reported that MAE velocity and response velocity were equal. In each case four trials were made, where high and low initial response velocity alternated. After each trial the S was allowed to rest for a while. The whole series for each S was carried out during two or three sessions extending over one week. Binocular vision was applied.

Table 1. The MAE velocity in degrees of rotation per sec. for 7 Ss at five different stimulus velocities.  $N = 4$ .

Subject	Velocities in degrees per sec.									
	1°		2°		4°		8°		16°	
	$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s	$\bar{X}$	s
A	1.32	.17	1.56	.15	1.77	.18	1.84	.23	1.68	.22
B	1.72	.21	1.62	.18	1.61	.16	1.65	.21	1.76	.22
C	1.54	.19	1.57	.17	1.73	.19	1.68	.20	1.40	.26
D	1.73	.25	1.93	.17	1.92	.19	1.87	.22		
E	1.68	.14	1.85	.13	2.00	.12	1.96	.16		
F	2.06	.16	2.08	.15	2.17	.14	2.02	.16		
G	1.37	.24	1.81	.21	1.85	.27	1.72	.31		
M =	1.63		1.77		1.86		1.82		1.61	

## RESULTS

The individual results for our seven Ss are given in Table 1. In Fig. 2 the total means are plotted against a logarithmic scale for stimulus velocity. It is evident that the results are unequivocal; under our experimental conditions the perceived velocity of MAE does not vary significantly with changes in the stimulus velocity, but remains constant to an astonishing degree. Even when the stimulus velocity is lower than this constant AE-velocity (1°/sec.) the velocity of MAE remains at the same level and thus, under these conditions, it is higher than the stimulus velocity, which seems a somewhat paradoxical result.

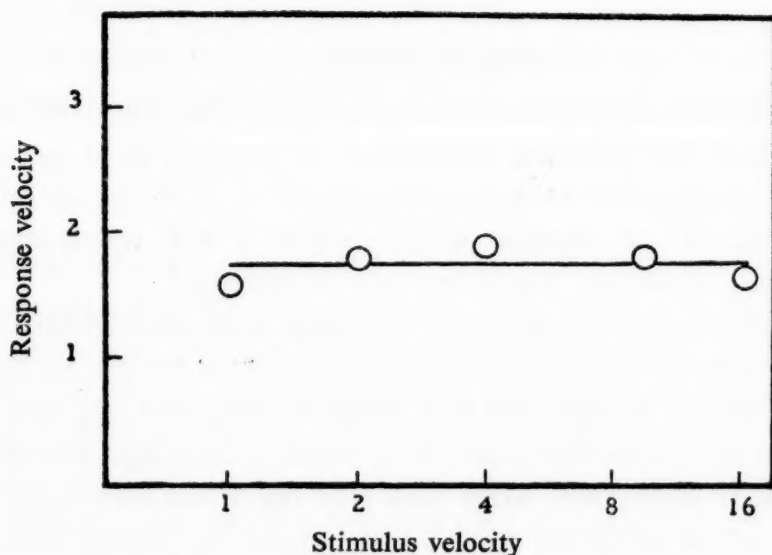


Fig. 2. MAE (response) velocity as a function of stimulus velocity. Both velocity measures are in degrees of rotation per sec.



## DISCUSSION

The result of our experiment is more or less directly opposed to the data reported in previous investigations on cumulative MAE velocity (2, 3, 8, 9). In spite of certain inconsistencies all these data indicate some kind of interdependence between MAE velocity and stimulus velocity.

This implies, that at best either our result or the whole group of conflicting results cannot be suitably used as a basis for a general statement on MAE velocity, and that at worst we have some kind of artefact or artefacts.

Is our result an artefact? We considered the question very seriously when we obtained this result. Consequently, we scrutinized very thoroughly both our own experimental conditions and those under which the other results had been obtained, from the different viewpoints: the methodological, the technical and the phenomenological. The result of this scrutiny may be summarized as follows:

In the earlier investigations both after-effects and real motions had been used as a basis for comparison. We employed real motion for this purpose. Consequently, differentiation is not due to this important alteration in method, as both methods had previously yielded changing MAE velocities.

The only differentiating condition seems to be that in the method of intermittent stimulation we keep the degree of satiation constant during measurement, while in all previous investigations this condition was not kept under control. Basler (1) has shown that MAE velocity is a function of the time subsequent to cessation of stimulation, and it was due to this fact that while engaged on our methodological work we devised the method of intermittent stimulation.

That our apparatus should produce a technical artefact must be regarded as impossible. The response velocity varied appropriately with the velocity of the real stimulus motion, when, by way of a test, this was taken as an object for measurement.

From the phenomenological point of view the distinctive, real character of our intermittent MAE must be regarded as an advantage when compared with the continuous MAE, which slowly fades out, and where conflict between displacement and actual localization is inherent.

It should also be pointed out, however, that the data resulting from Wohlgenuth's measurements (9) obtained by comparing two MAEs actually reveal a considerable degree of constancy in MAE velocity for the velocity span measured by him. A marked dependence upon the stimulus is found to exist for the lowest stimulus velocities. (Possibly up to our 4°/sec. level. Wohlgenuth reports the absolute stimulus velocity but not the distance to the observer, which makes it impossible to compute the angular velocity.) Thus these data perhaps tend rather to support than to contradict our result.

Wohlgenuth's attempt to measure the absolute velocity of MAE at a given stimulus velocity seems also to be in good agreement with our value. Assuming that the distance between distal stimulus and observer was 75 cm, Wohlgenuth's value would coincide with our mean value (1.74). However,

until we have investigated this matter, we are not justified in presuming that MAE velocity, stated in measures of visual angle, is a constant (this forms the basis for the above discussion). On the contrary, Granit (5) has shown that MAE has, at least in some respects, the character of a constancy phenomenon.

After carefully studying both our own experiment and those conducted by other investigators we found that our result must be regarded as valid.<sup>1</sup>

We are therefore justified in stating that the MAE velocity, as measured by our method, is not dependent on stimulus velocity.

From a physiological point of view this finding may assist in dispelling some of the "mystery" surrounding MAE. We need no longer trouble about finding an explanation of how a velocity may be accumulated and reproduced. We are justified in assuming that the neurological process, which is the physiological correlate to cumulative MAE, at a constant degree of satiation, has a fixed intensity, when it is a question of the quality corresponding to velocity in perception. It is independent of the velocity of the stimulus. Perhaps it is instead a function of the degree of satiation; for it is an established fact that MAE slowly fades out.

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1. In a personal communication, Hans Wallach has also reported that in similar experiments he has made observations which are in good agreement with our results.

# SYSTEMATIC OBSERVATION METHODS IN THE STUDY OF SMALL GROUPS

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During the last few decades a number of methods have been developed for the investigation of the behaviour of an individual as a group-member. As systematic observation of a discussion group makes it possible to record modes of behaviour the discussing individuals themselves are not able afterwards to remember, this method has recently found an everincreasing application.

For the first time this type of procedure was employed in the late 1920's in Germany, where test situations, termed "Rundesgespräch" or "Schlusskolloquium" were utilized in the selection of officers (1). Later on methods based on systematic observation of discussion groups have been developed primarily in the U. S. A. and in England.

Systematic observation can cover only small groups since the observer cannot follow the reactions of too many persons simultaneously. There is some disagreement among investigators as regards the number of individuals making up a "small" group. As a rule groups of 2 to 20 are considered small, but most often it is endeavoured to confine the observation to groups of no more than 10 individuals. The smaller the group observed, the more thoroughly the social event can be analysed.

Methods based on systematic observation – often called Interaction Process Analyses – and devised for the study of small face-to-face groups display a great deal of variation, depending on the purpose of the study and the kind of the group to be studied. Some basic problems however are common to all of them.

## I. BASIC PROBLEMS OF SYSTEMATIC OBSERVATION

### (a) *Frame of reference.*

The first question to be settled is what kind of attitude the observer is going to take. There are two possibilities:

1. The observer tries to identify himself with the person whose action he is registering.
2. The observer tries to take the position of the other members of the group.

Which starting point is more advantageous depends on the purpose of the study. Steinzor (16) has made use of the former alternative, and is of

the opinion that the relations between the members of a group are best understood when the observer's idea as to the intentions of an acting member is as similar as possible to the idea which this member himself has of his own intentions. Bales (2), on the other hand, takes the view that the observer should try to identify himself with the other members of the group, preferably with the person towards whom the action is directed. According to him the conscious or unconscious intention of the acting member is less important from the point of view of the interaction than is the way in which this intention is apprehended by the other members.

*(b) Choice of unit.*

The unit of observation can be either a time unit, when the performance is scored at regular intervals only, or an "act", when a complete action forms the unit, regardless of its duration. Usually a time unit and an "act" are used simultaneously.

As to the time unit it has to be borne in mind, as is pointed out by Zander (17), that a unit which in one context is feasible may be psychologically meaningless in another. Thus a short time is unsuitable for many purposes, while at other times it has been found necessary to register reactions at very short intervals. When records are kept on a time unit basis, it is frequently advantageous to let different observers use time units of different duration so that someone has to categorize short remarks and someone else observes behaviour that is liable to give an erroneous picture if only short time units are employed.

In the choice of unit there has been a great deal of diversity among the investigators. When verbal behaviour is observed the unit can be, e. g., a sentence, an interval between breathing spaces, or a whole thought. It is even more difficult to select an observation unit for motor behaviour since motions are often continuous; in other words, it is difficult to distinguish parts of a motion which could be considered as units. Some investigators employing acts as units when examining verbal behaviour have considered it best to resort to time units as soon as motor activities are involved. The selection of an act as a unit may also depend on whether reactions of the separate group-members or those of the group as a whole are studied. Thus a speech by one member, a decision reached, or a task carried out, have variously been used as acts for the whole group.

Selection of the most suitable act is affected by the frame of reference as well as by the choice of time unit. Some investigators, such as Lewin (15), emphasize the importance of observing sufficiently extensive sequences of acts. They take the view that when one attempts to observe social relations,



the unit must be chosen so as to give information about the interaction between two individuals, and not merely about the action of a single individual participating in the interaction. On the other hand, the use of a large unit renders the work of the observer difficult, as it presupposes that he is able to keep in mind the earlier reactions of the members of the group. In order to reach a sufficiently high observer reliability, a rather small unit has occasionally been employed, e. g. in Bales' method. Although the choice of a small unit has been called forth by practical requirements, it may be defended on other grounds as well. Since interaction by nature is bipartite, comprising a stimulus and a response, recording the two different parts of the interaction separately does not necessarily imply an artificial division of the total interaction.

(c) *Categorizing.*

By categorizing is meant that the observer classifies each act in one or several categories on the basis of the qualitative aspects of the behaviour. From the point of view of observer reliability it may be more advantageous to use a method in which every act can only be put into one category. The type of the unit of observation chosen naturally affects the issue in such a way that when a unit of long duration is used, it may be desirable from the point of view of the analysis to attempt to classify each act in more than one category, in order to bring out various aspects of the behaviour. In cases of this type it is advisable to use several observers, each observing the behaviour from a different point of view.

## II. PROBLEMS OF THE PRESENT STUDY

Interaction methods can differ from each other as regards the frame of reference, the choice of units and the manner of categorizing. Two general methods representing different types are compared with one another below. They have been chosen so that no essential divergences are involved as regards the frame of reference or the choice of units. The comparison will accordingly be confined to the method of categorizing. The methods compared are those of Bales and Carter-Haythorn-Meirowitz-Lanzetta. In this study their practical value rather than their theoretical background will be scrutinized.

In order that an interaction method may be considered appropriate, it has to satisfy certain requirements. A good method must render the categorizing of different modes of behavior possible, i. e., it should enable as many different types of behaviour as possible to be grouped in their proper classes, and the reliability of the method must be sufficiently high.

In addition to the comparison between the methods of Bales and of Carter-Haythorn-Meirowitz-Lanzetta, use was made of the former in a more extensive study, and its properties were subjected to a more detailed analysis. An attempt was made to find out whether – and to what extent – differences occur between Finnish and American results, and whether the distribution of the different reactions varies – and to what extent it varies – from one type of group to another.

### III. COMPARISON OF THE METHODS OF BALES AND OF CARTER-HAYTHORN-MEIROWITZ-LANZETTA

In both the methods of Bales and of Carter-Haythorn-Meirowitz-Lanzetta the observer tries to identify himself with some non-active “average” member of the group. The observation unit, being the smallest discernible section of verbal or non-verbal behaviour that can be placed in some category, is also the same in both methods. Nor are there any differences with respect to the attributing. Consequently comparison of the methods must be confined to categorizing only.

#### *(a) Bales' method.*

Bales' starting point was empirical. To reach a sufficiently high observer reliability the number of categories was reduced from 89 in the original version (4) to 12 in the final one (2). Bales' categories are listed below:

#### *The Bales Method: List of Categories.*

1. Shows solidarity, raises other's status, gives help, reward:
2. Shows tension release, jokes, laughs, shows satisfaction:
3. Agrees, shows passive acceptance, understands, concurs, complies:
4. Gives suggestion, direction, implying autonomy for other:
5. Gives opinion, evaluation, analysis, expresses feeling, wish:
6. Gives orientation, information, repeats, clarifies, confirms:
7. Asks for orientation, information, repetition, confirmation:
8. Asks for opinion, evaluation, analysis, expression of feeling:
9. Asks for suggestion, direction, possible ways of action:
10. Disagrees, shows passive rejection, formality, with olds help:
11. Shows tension, asks for help, withdraws out of field:
12. Shows antagonism, deflates other's status, defends or asserts self:

Categories 1-3 and 10-12 constitute the social-emotional sphere, the first three categories containing positive, and the last three negative reactions. Categories 4-9 constitute the neutral task area. Categories 1 and 12 involve problems of integration, 2 and 11 problems of tension-manage-

ment, 3 and 10 problems of decision, 4 and 9 problems of control, 5 and 8 problems of evaluation and 6 and 7 problems of orientation (6).

According to Bales (3), at the beginning of the observation situation unsolved problems of orientation, evaluation and control occur. These problems are common to a great number of social events, and they may be at least partly solved in the course of the situation. Bales therefore classifies the problems to be given to a group into "truncated" and "full-fledged" ones. The former term refers to the task during the performance of which the group has not been observed to solve the problems of orientation, evaluation and control, but in which some of these either have not been presented at all or have remained partly unsolved. According to Bales the "full-fledged" problems are more adequate for the study of various sorts of behaviour, and the theory of his method has therefore been developed on the basis of such problems. In all kinds of small groups, a certain internal differentiation between persons exists or tends to develop due to the fact that the members of the group are different from each other and that they identify themselves with the in-group to a varying extent. These differences between the members can be ascertained when observing their acts.

Bales has also attempted to make his categories indicative of intensity differences and not only differences in kind. This is particularly the case with the categories of the emotional sphere, where intensity differences are most frequently encountered.

*(b) Carter-Haythorn-Meirowitz-Lanzetta method.*

This method has also developed empirically. The exponents of it do not consider Bales' list of categories sufficient for the observation of all kinds of behaviour (10). They believe that it is possible to attain sufficiently high observer reliability by using a method with a fairly large number of categories. They worked out their method to cover as many different kinds of behaviour as possible, as is evident from the following list of categories.

*The Carter-Haythorn-Meirowitz-Lanzetta Method: List of Categories*

1-19 Shows personal feeling of

1. Aggressiveness or anger.
2. Anxiety or insecurity.
3. Attention or readiness.
4. Confusion.
5. Cooperativeness.
6. Deference.
7. Dissatisfaction.
8. Status bestowing.

9. Friendliness.
  10. Negativism or rebelliousness.
  11. Satisfaction or accomplishment.
  12. Superior status.
  13. Tension release.
  14. Signs of frustration.
- 20-39 Proposes and initiates action.
20. Tells someone to do something (less strong than 44).
  21. Calls for attention.
  22. Asks for information or facts.
  23. Diagnoses situation – makes interpretation.
  24. Asks for expression of feeling or opinion.
  25. Proposes course of action for self.
  26. Proposes course of action for others.
  27. Supports or gives information regarding his proposal.
  28. Defends self (or his proposal) from attack.
  29. Initiates action towards problem solving which is followed.
  30. Supports proposal of another.
  31. Agrees or approves.
  32. Gives information.
  33. Gets insight.
  34. General discussion re task.
  35. Expression of opinion.
  36. Shows understanding after explanation.
  37. Concedes to the point of another.
- 40-49 Disagrees and argues – with somewhat negative connotation
40. Disagrees or sceptical.
  41. Argues with others.
  42. Contradicts or amends.
  43. Deflates others.
  44. Gives bald commands or prohibits.
  45. Interrupts.
- 50-59 Leader roles in carrying out action.
50. Gives information on how to carry out action.
  51. Praises, commands, rewards.
  52. Expresses a desire that something be done.
  53. Asks for assistance for others.
  54. Asks for assistance for self (not for direction).
  55. Integrates group behaviour.
  56. Mediates, intercedes.
  57. Repeats or clarifies.
- 60-69 Follower and worker roles in carrying out action.
60. Follows suggestion or directions.
  61. Offers to help or helps.



- 62. Imitates others.
- 63. Asks for permission.
- 64. Collaborates with others.
- 65. Answers question.
- 66. Performance of a simple work unit (group oriented).
- 67. Performance of a simple work unit – an independent effort.
- 68. Asks for suggestion or direction.

70–79 Non-productive behaviour re problem.

70. Mediates.

71. Listens, but does not enter in.

90–99 Miscellaneous.

90. Engages in "out of field" activity, withdrawal.

A part of this list has been left open to allow the addition of special categories required by any special study at hand. Unfortunately, no information about the theoretical background of the method has been published. Detailed categorizing rules cannot be obtained either.

*(c) Procedure.*

The present study was confined to the observation of verbal behaviour. Since no Interaction Recorder (5) or stenographic machine as used by Carter-Haythorn-Meirowitz-Lanzetta (9) were at our disposal, it would have been too difficult to follow and record all kinds of behaviour. Besides this, the use of a tape-recorder made possible a subsequent control of the original categorizing. The lists of categories used in both methods were employed in this investigation. No additional classes were used in Carter-Haythorn-Meirowitz-Lanzetta method.

Since no observation room was available where the behaviour of the members of the group could be observed through a one-way mirror, the observers were present in the experimental room. According to Steinzor (16) people become accustomed to being under observation in different kinds of social situations, and the awareness of being observed does not appreciably alter their behaviour. Bales (2) also states that the behaviour is not considerably affected by the presence of the observer in the experimental room. In this investigation it also seemed evident that the group-members very soon "forgot" the presence of the observer.

Training of observers took place in such a manner that upon learning the list of categories of both methods, and the additional instructions given by Bales, the recorded material was categorized so that each act was jointly placed in a category, and reasons for its placing were given. Subsequently the observers had to perform the categorizing of recorded ma-

terial individually. The resulting scores were compared with each other, and when acts were classified differently, the various possibilities were discussed. As a third stage, categorizing was carried out in discussion situations and the individual classifications were again compared with each other. The study to be reported here was not begun until the categorizing by the different observers had reached a sufficiently reliable standard.

Each group of subjects participated in two observation experiments. During both experiments they discussed two topics introduced by the experimenter. In the beginning of the experiment the right of a policeman to use weapons and conditions in jails were under consideration, whereas child education and family budget were the topics discussed during the last part of the experiment. Each introduction by the experimenter lasted for about three minutes; he discussed different alternatives but did not express his own standpoint. The discussions were informal and there was no actual chairman. The experimenter did not break in, except when he was asked something, or if the discussion died out. The discussions were recorded on tape for 15-20 minutes, but if the subjects wished to continue, the recording was discontinued without any interruption of the discussion. Between the two discussions a problem was assigned to the groups. The assigned problems were similar to those presented by Harris (12 p. 117) and they covered the selection of the site of a summer cottage and necessary annexes on the map of an island, and the finding of as good a site as possible for a residential district, also on a map. A large-scale map and cardboard chips representing the buildings were on the table, and every group-member was given a smaller-scale map with the aid of which he had to make his own decision. When the individual group-members had made up their minds, an attempt was made to select the best alternative in joint discussion. Most of the discussions were also recorded on tape for about 20 minutes, but owing to some technical difficulties, some of them could not be so recorded. This did not seriously affect the comparison of the two methods however, although it prevented carrying out a detailed analysis concerning the influence of the kind of the group and of the assigned problem on the distribution of the acts among different categories.

### 1. The experimental groups.

There were 5 experimental groups, each group consisting of 5-6 male subjects of 18-45 years of age. The members of each group were acquainted with each other, at least to some extent. An attempt was made to incorporate into each group persons from the same social level. The

members of group I and II were university graduates. The members of group III, who were served alcohol in the course of the experimental situation, were middle school graduates, and the subjects in groups IV and V were elementary school graduates.

## 2. Scoring.

In the course of experimental situations primary categorizing was carried out. As mentioned above, the observation was confined to verbal behaviour. Later on a new and more accurate categorizing was carried out from a tape recorder. All observations were categorized both by the Bales and the Carter-Haythorn-Meirowitz-Lanzetta method. In order to determine the observer reliability, the observers carried out their judgments independently. The frequencies in each category were computed for all group-members. In order to make the groups comparable, in spite of the differences in total frequencies, the obtained figures were transformed into percentages.

### *(d) Results.*

#### 1. Distribution of acts among categories.

When the scoring was made by the Bales method, 1772 out of the 3602 acts observed were classified in category 5. The frequencies of categories 6 and 2 were quite high too. In the former there were 854 (23.6 %) and in the latter 442 (12.5 %) acts. Tallies classified in category 10 were also numerous, 260 (7.2 %). In the other classes the frequencies were smaller. There was only one act categorized in class 9 and none in category 11.

When inspecting the category frequencies of each group separately some differences can be noticed. The profiles presented in Figure 1 illustrate the distribution in each of the groups. The profiles have been obtained by finding the proportion of the acts in each category in per cent of the total number of the acts.

Groups I and II seem to be quite similar. The only differences between them are to be found in categories 5 and 6. The first group has 61.7 % of all acts in category 5 and only 19.4 % in category 6. The corresponding figures for group II are 41.2 % and 43.8 %. The members of group III, who were served alcohol during the experiments, turned out to be more aggressive than the others. The figures for this group in categories 10 and 12 are higher than those for the other groups, while the number of positive emotional reactions is much the same in all groups. The frequency

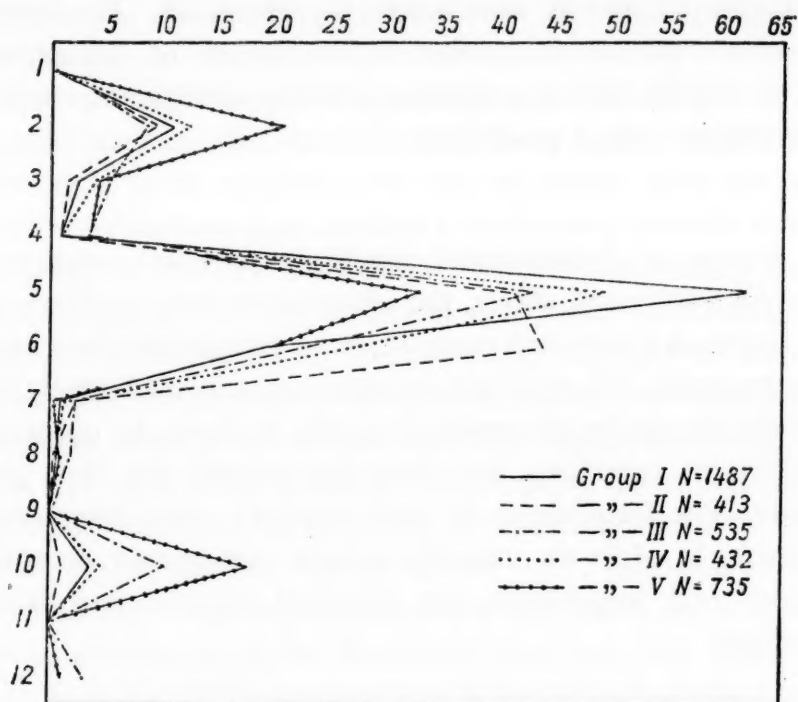


Figure 1. The profiles of the groups.

of category 3 is somewhat higher than the average, but, on the other hand, the frequency of class 2 is smaller than in any other group. Figures for group IV do not deviate much from the average category frequencies. On the other hand, the members of group V, who were the youngest of the subjects of this investigation, their average age being about 20 years, were found to be more emotional than the others. The numbers of both positive and negative reactions are here greater than in other groups. As much as 20.5 % belong to category 2. The frequency of class 10 is 17.6 %, i. e. even higher than that for the alcohol group. The increase in the number of emotional reactions brought about a decrease of the acts in category 5, the frequency of this class being no more than 32.6 %.

When the Carter-Haythorn-Meirowitz-Lanzetta method was used the acts were categorized into 31 classes, but the frequencies of most classes were rather low. Almost two-thirds of all the acts were classified in categories 34 and 35, the former containing 33.5 % and the latter 30.2 % of all reactions. Classes 13 and 40 also show fairly high figures, viz., 12.4 % and 5.2 % respectively.

When examining the figures for the different groups separately, it may be noted that group V differs clearly from the rest, as it did when the Bales method was used. The frequencies of categories 34 and 35 (25.9 % and 20.1 %) were for this group much lower than the averages, being even



lower than the frequencies for the alcohol group. On the other hand, a considerable number of the acts in group V were placed in categories 13 (21.1 %) and 40 (11.8 %).

As is evident from the above acts recorded in cases like the present reveal – whichever of the two methods is used – a tendency to concentrate in a certain few categories, the frequencies of all the others remaining comparatively low. Certainly it may be assumed that if the number of acts increases, wider scattering to different classes will occur, but its effect on the results is probably not very great. Furthermore, the groups in this study represented such wide ranges of variation as regards age and social level, that most of the common types of human behaviour may be supposed to have been present in the reactions of their members.

## 2. Observer reliability.

When examining the observer reliability of independent judges, one must investigate to what extent categorizing by different observers has been similar, i. e., how closely they have been able to follow the rules given. Naturally the observations can never be quite consistent. Systematic training reduces variations of observation, but it is hardly possible to eliminate them altogether. On the other hand, the fact that different observers are apt to commit the same kinds of error is liable to increase the observer reliability score.

According to Bales, the use of the product moment correlation coefficient is not to be recommended for a comparison of scores by independent judges, even though it is often used as a measure of observer reliability in interaction process analyses.  $r$  is determined preponderantly by the large values of the distribution, and it is not very sensitive to variations in values with small densities.

In determining observer reliability, two techniques have been used by Bales. The first is a graphic one, and in it the number of units of any category as noted by independent observers are plotted on the binomial probability paper designed by Mosteller and Tukey. In the second method the Chi-square is used. This measure tends to be quite sensitive to variations in the pairs of values of even smaller magnitude. Moreover, it is easy to compare the observations of more than two judges by means of Chi-square. The mean frequencies of the independent observations in each category can conveniently be taken as a theoretical value, while if one or both observers register(s) lower frequencies than five in some categories, Bales recommends that these frequencies be combined. He has suggested the use of Chi-square at the .50 probability level.

In this investigation an appreciably higher probability level was reached with Bales' method. In all cases but one the level exceeded .90. Accordingly the observer reliability attained may be considered to be very good. Further discussion of category reliability will be omitted in this connection. We will return to this subject later on when the more comprehensive study carried out with the Bales method will be reported.

The originators of the Carter-Haythorn-Meirowitz-Lanzetta method have not used Chi-square for the determination of observer reliability. They have computed reliabilities by correlating the number of units of behaviour for particular categories awarded each individual subject by independent observers over a particular unit of time (9). They do not present any actual figures, however, and therefore our results could not be compared with theirs. Furthermore, as our intention was to compare the results attained by both the Bales and the Carter-Haythorn-Meirowitz-Lanzetta methods, observer reliability has in the latter case also been determined by using Chi-square.

When using the latter method the judgments of independent observers did not result in sufficiently high reliabilities. In a few discussions the reliability of the categorizing was as high as .99, the observations being almost consistent. On the other hand, there were situations where the scoring was so dissimilar that observer reliability was no more than .05.

It is possible that the unsatisfactory results obtained with the Carter-Haythorn-Meirowitz-Lanzetta method result from inadequate definitions of the categories. This, however, cannot be the only reason for the weak observer reliability. It seems obvious that some categories are so similar that it is too hard even for trained observers to distinguish them consistently.

### 3. The formal properties of the methods.

The comparison of the Bales and the Carter-Haythorn-Meirowitz-Lanzetta methods reported above has been confined to categorizing. In compiling a list of categories the following points have to be taken into consideration:

1. The list of categories should be exhaustive, so that all responses can be classified.
2. The categories should be mutually exclusive, so that a given response cannot be placed in more than one category.

Both methods have obviously aimed at an exhaustive list of categories. For this reason the Carter-Haythorn-Meirowitz-Lanzetta method contains

a number of open categories in order to make possible the classification of even the rarest responses which might occur in special studies. The compilation of a list of mutually exclusive categories is obviously difficult. Among the reactions of a subject there always occur borderline cases which can be categorized only on the basis of considerations as to which category would best reflect the type of behaviour concerned. In order to overcome this difficulty, some investigators, like Bales, have formed rules for the classification of doubtful cases. On the other hand, in an efficient method the categories have to be defined sufficiently clearly in order to make their distinction possible.

If the number of categories to be kept in mind is too large, there is danger that the observers "forget" some of them. They are only apt to make use of some few categories and to omit the rest. Thus the method becomes cruder than the original set of categories would imply. Within the bounds of this investigation, the Carter-Haythorn-Meirowitz-Lanzetta method did not seem completely satisfactory in this respect.

In the investigation of group behaviour, and in the compilation of lists for the categorizing of acts, two main aspects are to be considered. For one thing, the method must be easily employed in the sense that its application gives satisfactory observer reliability. On the other hand, it must allow a sufficiently detailed classification of different types of behaviour. If, in a certain method, the frequencies of acts in some of the categories tend to become comparatively large, one should examine whether this category can be sub-divided in order to make possible more accurate judgment of the behaviour. However, such a subdivision is not always convenient, since the large number of acts in some categories may be a simple consequence of the fact that this kind of behaviour is more common than other kinds. When making observations with the Bales and the Carter-Haythorn-Meirowitz-Lanzetta methods, it was ascertained that the frequencies in some of the categories turned out to be fairly high. As the number of categories in these methods is markedly different, it is probable that in situations of the kind considered, certain types of responses are particularly common.

From the above considerations it is evident that the Carter-Haythorn-Meirowitz-Lanzetta method, despite its larger number of categories, did not give more accurate results than the Bales method. Moreover, the observer reliability remained too low in the former method, as its definitions of classes are not sufficiently precise.



#### IV. AN INVESTIGATION BY THE BALES METHOD

In order to render a further appraisal of the Bales method possible, a more extensive investigation was carried out. It was designed in the same way as the preliminary study reported above, with the exception that all the above-mentioned experimental tasks were given to all the groups. This being the case, it was possible to examine the influence of the nature of the test tasks upon the distribution of acts. The comparison of the results of the different groups was comparatively straight-forward, as the number of acts did not differ from group to group as much as when the methods of Bales and Carter-Haythorn-Meirowitz-Lanzetta were compared.

##### *(a) Observation situations and experimental groups.*

The observation situations were arranged in the same way as in the earlier comparative study. The discussion topics as well as the problems assigned to the groups were the same. There were seven groups, each containing 5-6 members. The subjects were all men, their age varying from 18 to 45 years. An attempt was made to put people of the same social status into each group. The members of groups I and II were university graduates. In group III the subjects were university students. The members of groups IV and V were graduates of middle school and in groups VI and VII the subjects were elementary school graduates. The scoring was carried out as reported before.

##### *(b) Results.*

###### 1. Results of categorizing.

The observed acts were distributed into different categories as shown in Table 1. More than half of all the acts were in class 5. The frequency of category 6 was also fairly high, viz. 19.2 %. In the emotional sphere, the figures in categories 2 and 10 were higher than those of other classes. Frequencies of all other categories were comparatively low.

An examination of the category frequencies of different groups reveals that groups I and II, the members of which represented a higher social status than the other subjects, are much alike, and their frequencies differ from the average figures in such a way that the number of emotional reactions is lower. On the other hand, in group III, the subjects of which were university students about 20 years of age, emotional reactions are quite numerous. The frequencies in categories 2 and 3 as well as in category 10 are higher than the average. Groups IV and V are dissimilar mainly in regard to category 2. In group IV the number of this type of reaction



Table 1. The Results of Categorizing (the Bales Method).

Cate- gory	Group I %	Group II %	Group III %	Group IV %	Group V %	Group VI %	Group VII %	Group I-VII %
1	0.1	0.2		0.1	0.5	0.3		0.2
2	10.6	6.4	16.0	16.4	9.4	3.2	23.3	13.8
3	2.4	2.8	7.1	3.2	3.1	3.7	3.1	3.6
4	0.7	0.5	2.1	1.8	2.8	0.8	1.9	1.6
5	61.7	63.7	53.5	47.4	52.7	47.6	43.1	52.4
6	19.4	22.5	10.2	23.4	22.6	37.1	12.1	19.2
7	0.9	1.5	2.4	1.2	2.5	0.5	0.7	1.4
8	0.6	0.5	1.0	0.2	0.7		1.1	0.7
9								
10	3.6	1.8	7.7	6.3	5.6	6.3	14.1	6.9
11		0.1						0.0
12					0.1	0.5	0.6	0.2
$\Sigma$	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	1487	1299	1306	1468	1080	649	1953	9242

(16.4 %) is distinctly larger than in group V (9.4 %). This is undoubtedly due to the fact that the subjects in group IV are much younger than those in group V. The dissimilarity between groups VI and VII is also quite considerable. Group VII, the members of which are only a little more than 20 years old, has markedly higher frequencies in both the positive and the negative emotional categories than group VI, the subjects of which are 30-45 years of age.

As is evident from Table 1, the acts reveal a tendency to accumulate into categories 5 and 6. The number of emotional reactions decreases with increasing age and social level.

## 2. Comparison with Bales' results.

After having studied different kinds of small groups, Bales determined the limits of percentage frequencies in different categories for the "normal population" on the basis of 22,970 observed acts. These limits, together with the average results of the present investigation, are shown in Figure 2.

It will be noticed that the frequencies of categories 3, 4, 5, 7 and 11 are outside the limits obtained by Bales. The frequency of class 5 is clearly above the upper limit, while the rest lie below the lower limit. When the figures of the present investigation are compared with limits given by Bales and particular attention is paid to the frequencies in categories where the averages deviate from these limits, category 5 is the most interesting one,

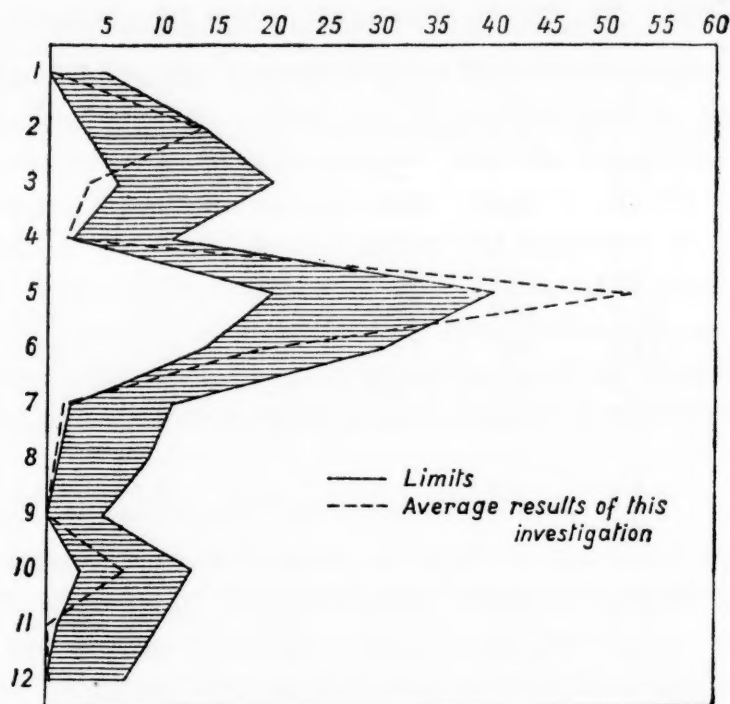


Figure 2. The limits for normal population and the average results in this investigation.

as the frequencies for each group in this category exceed the higher limit. In category 11 the material of this investigation seems to remain under the lower limit. In category 2 the range of variation is rather large.

It is difficult to say what is the main cause of the differences between the results in this investigation and the limits determined by Bales. One reason may be the dissimilarity between the American and the Finnish populations. Bales has remarked: »We assume that the participants will be members of our own culture. This gives us some expectation that they will speak English...» (6) On the other hand, even though an attempt was made to follow Bales' definitions of the categories and his rules of categorizing, differences may be partly attributable to systematic dissimilarities in classification. Yet, as already mentioned, the main cause is probably the dissimilarity between the American and the Finnish populations.

### 3. Differences between problems and discussions.

As the quality of the task given to the groups may influence their behaviour, and since the changes in the behaviour may be reflected in the scattering of the acts observed, the two types of tasks will be examined separately.

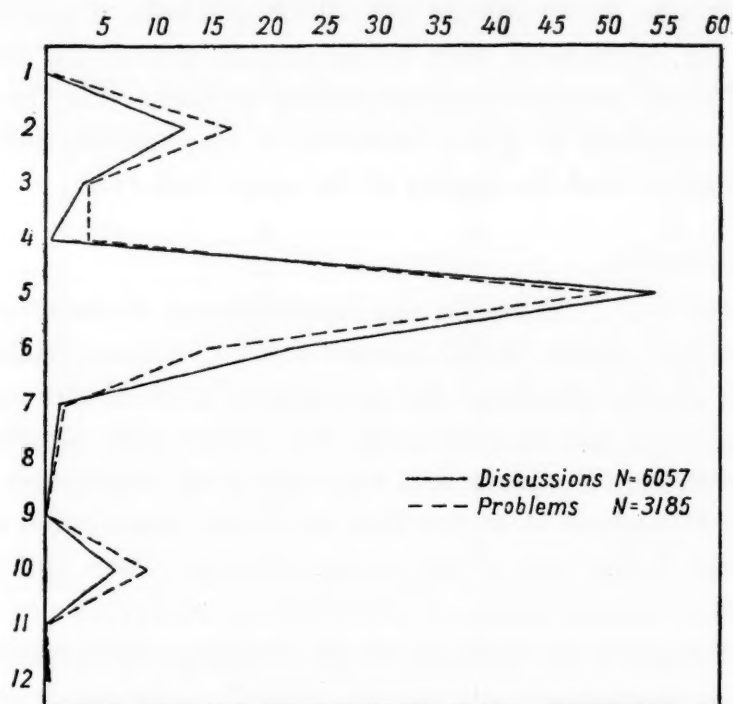


Figure 3. The differences between discussions and problems.

The profiles in Figure 3 show the classification of the observed acts. The frequencies in problem and discussion situations show very small differences. The only considerable difference is found in category 6 as discussions more often than problems have called forth acts belonging to this class. This was not unexpected as the former are apt to bring about more oral narrative than the latter. It is somewhat surprising that the difference in category 4 is not larger. As the frequency of acts in this category is so small in problem situations, there is reason to assume that suggestions were presented in the form of opinions, and they have therefore been placed in category 5 by the observers. On the basis of this material it seems likely that the problems cause somewhat more emotional reactions than discussions. However the differences are so small that they might be due to chance only.

When the categorizing of acts is examined group by group, it appears that problems are apt to cause more aggressiveness than discussions, in spite of the fact that some of the topics of conversation – the right of a policeman to use weapons and conditions in jails – were apt to call forth contrary opinions. The differences in other respects were generally small.

The above seems to indicate that the distribution of acts into different categories was very similar in problem and discussion situations. However, this similarity may partly be attributable to the quality of the problems

given to the groups. It is possible that different kinds of problems, more dissimilar to the discussions than those used in this study, may lead to somewhat different results. E. g., according to Carter-Haythorn-Shriver-Lanzetta the behaviour of group members is considerably influenced by the kind of situation and the quality of the given task (11).

#### 4. Observer reliability.

The method used by Bales for the determination of observer reliability has been described above. In the present study observer reliabilities were quite high. In all the situations the probability level of .50 suggested by Bales was exceeded, and in most cases the results were significant at the .90 level. It thus seems evident that very high total reliabilities can be attained by Bales' method. A factor that may have contributed to the high total reliabilities is the size of the group observed. Bass and Norton (7) have found that classifications of independent observers are more consistent when the group is made up of six members than when it is some other size.

The total reliability score does not, however, tell the whole story of the trustworthiness of the method. As long as the frequencies are small, comparatively large differences between the categorizing of independent observers do not always affect the value of Chi-Square, as the figures from categories in which one or both observers have a category frequency less than five are combined. If a clear picture of the suitability of a list of categories is wanted, one has to take into account the individual category reliability in addition to the total reliability.

As a rule, the category reliability is to some extent different in different categories. Bales, who has used the product moment correlation coefficient when determining the reliability for individual categories, has found that by using trained observers a reliability between .75 and .95, depending on the scoring category, can be reached (8).

In this investigation, category reliability has been determined by computing the ratio – in per cent – of the number of acts placed in a category by both of the independent observers to the total number of acts placed in it by at least one of them. If category reliabilities are determined in this way, they not only indicate whether the observers have put the same number of acts in the same category, but also whether they have been able to place the same act in the same category, and this, of course, must be the final goal of systematic observation.

The coefficients of category reliability obtained in the present study are listed in Table 2. Since they have been determined in another way than



Table 2. The Category Reliabilities.

Category	$\Sigma$ of agreeable categorizings	$\Sigma$ of all categorizings	Per cent
1	2	2	100.0
2	127	148	85.8
3	56	68	82.4
4	21	33	63.7
5	252	314	80.3
6	193	236	81.4
7	9	17	52.9
8	3	8	37.5
9			
10	114	159	71.7
11	0	1	0.0
12	9	13	69.2

those reported by Bales, they cannot be compared with his figures. Table 2 shows that the category reliabilities are not satisfactory in such classes where the total frequencies have remained small, but otherwise the results may be considered to be fairly good.

The category reliability is likely to be decreased by the fact that acts can only be classified in the emotional or in the task area. If, e. g., a member of the group speaks somewhat aggressively, but this aggressiveness is so slight that the action cannot be placed entirely in category 10, only some of the acts have been classified in category 10 and other acts, for example, in category 5. If the independent observers place different acts in category 10, this has no effect on the total reliability, but the individual category reliabilities may become unsatisfactory.

The present study indicates that the Bales method can lead to quite high total reliabilities and when sufficiently high total frequencies are concerned, probably also to satisfactory category reliabilities.<sup>1</sup>

## V. ON THE DEVELOPMENT OF INTERACTION METHODS

The first interaction process analyses were developed for special purposes. When they were found to yield reliable results, some investigators began to develop general methods. However, interaction methods are still mainly developed for the study of special limited problems, and the opinion is occa-

1. A general discussion of problems connected with the determination and evaluation of observer reliability in systematic interaction methods can be found in another article by the writer (14).

sionally voiced that adequate results cannot be attained by general methods. E. g. Zander writes: "Obviously, the variety of things which an observer may record is enormous. What he is asked to notice depends upon the data desired, which in turn is determined by the theory behind the research and the limitations of observer load. It is not possible, therefore, to list a standard set of observer categories which would be relevant to studies of all, or even many, variables of small-group research" (17). Yet there is reason to call in question whether it is more advantageous to continue the design of new special methods, or to try to develop a satisfactory general method which could be used regardless of the quality of the group to be observed, or the aim of the investigation, and which could be supplemented with additional appraisals when necessary.

During the study reported above it became apparent that the intensity differences of behaviour could not be taken into account in an adequate way when the present techniques were used. In the methods of both Bales and Carter-Haythorn-Meirowitz-Lanzetta, the problem of intensity has admittedly been taken into consideration when compiling the list of categories. Thus the differences between certain categories are not only qualitative but depend on the intensity as well. It seems doubtful, however, whether it is worth while to try to include both quality and intensity differences in the categories. If this kind of solution is desired, the intensity differences ought to be taken into account with regard to all possible kinds of behaviour. However, before investigators are able to measure intensity differences, in other words, before units are found for their measurement, categorizing of behaviour on the basis of its intensity is impossible. During the observation of alcohol situations it became clearly evident that the changes in behaviour were to a large extent changes in intensity, which are not satisfactorily reflected in the Bales or the Carter-Haythorn-Meirowitz-Lanzetta method. A thorough study of this aspect of behaviour and the development of suitable methods for the measurement of it would be of considerable importance.

It was pointed out when discussing category reliability that the observers met with difficulties, because an act could only be placed either in the task area or in the emotional area. Most of the acts, however, are neither purely functional nor purely emotional, but contain elements from both spheres. Of course, one may maintain that it is sufficient if the most conspicuous part of the reaction is taken into consideration. However, this leads to an omission of other parts of the behaviour. This difficulty could be solved by using two-dimensional categorizing, one dimension being emotional, the other functional. Then the number of categories

would increase, but hardly as much as to make the method difficult to use. If such a method were employed, an act could be placed into its class in the task area, but it could simultaneously be classified as positively or negatively emotional or as neutral. E. g., on the basis of Bales' list of categories: any opinion might be classified as sympathising, releasing tension, neutral, showing tension or as aggressive. It may be argued that the use of two classification principles instead of one makes desirable an increase in the number of observers, two of whom would categorize the quality of behaviour, while two others concentrated on its emotional aspects. In the opinion of the writer, however, this is not necessary, at least not if the total number of classes is relatively small.

### SUMMARY

A comparison was made between the Bales and the Carter-Haythorn-Meirowitz-Lanzetta methods of systematic observation. The comparison was limited to the categorizing of verbal behaviour. It was found that there are several deficiencies in the latter method with respect to the classes used, and that satisfactory observer reliability could not be obtained. By using the Bales method, on the other hand, fairly high total observer reliabilities were achieved, and even the category reliabilities in various classes turned out to be satisfactory, provided the category frequencies were large enough.

In a further study using the Bales method, the relative frequencies in several classes were found to be outside the limits determined by Bales. The main reason for this is presumably the dissimilarity between the American material used by Bales and the Finnish material of the present study. An attempt was also made to assess to what extent differences in the quality of the task presented to the groups cause differences in the categorical distribution of the acts observed. Discussions and problem situations tended to call forth very similar results, while the number of emotional reactions was found to decrease with increasing age and higher social level.

Attention is drawn to the fact that intensity differences cannot be adequately taken into account when either of the methods discussed are used. Finally it is suggested that the categorizing of behaviour could be made more accurate if a two-dimensional system of categorizing were adopted in place of the present unidimensional ones.

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## PERSONALITY-CHANGING PROCESSES OF PSYCHOANALYTIC TREATMENT

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In a paper (5) I have set forth the results of a follow-up investigation of 28 patients whom I treated psychoanalytically in the years 1926-1943. As the conclusion drawn from the follow-up investigation it emerges with a high degree of probability that in a large percentage of the cases studied, psychoanalysis introduced a new and significant factor which had a lasting personality-changing effect in the direction of greater psychic health and maturity.

The commonest lasting personality changes observed as results of the analysis are changes of interpersonal relationships and changes in capacity for work and enjoyment of work. Changes in capacity for sexual adjustments and in perception of reality are also very common after the analysis.

How, then, are these lasting changes achieved? What is it that actually happens in the analysis? And what is it that operates therapeutically and in the changing of personality?

Extensive as is the literature on psychoanalysis, there is still considerable uncertainty about these very essential questions. In the following pages, therefore, some analytical material will be given which throws further light upon them. Introductorily, I will make an attempt to clarify in principle the relationship between the various forms of analytical technique; and I will also try to show that the different techniques can release the same processes and lead to the same therapeutic result.

### I

As my starting-point I take a very simple example, described in an extremely schematic manner:

Let us imagine a pretty common infantile conflict situation. A girl between two and three gets a brother. Till then she has been the only child. Now the mother's interest is primarily concentrated on the new baby. The little girl is jealous and reacts by being obstinate and "naughty". As a compensation she turns to her father, but he is stern and uncomprehending. All the child's tremendous outpouring of emotion is baffled by a wall of misunderstanding on the part of her father and mother alike. Her attempts to assert herself are scolded and punished as naughtiness. At last the child "gives up", withdraws into herself and masters the situating by "repressing" or "blocking" her feelings.

Such a solution of the conflict acquires a significance for the entire subsequent life of this child. Of course the circumstances are complex, and many factors are involved. But our purpose here being merely to give an illustration in elucidation of certain technical points, we can treat the example in a highly schematic way and say that a study of the girl as an adult reveals a triple result:

First, we find offshoots of the unconscious infantile conflict in the form of *neurotic symptoms*; also *symbolic expressions* of it in dreams. Analysis of the dreams brings to light, for instance, unconscious desires for the brother's death, envy of his being a boy, fear of big dangerous beings, longing for the mother's breast, etc.

Secondly, we find that the conflict has exercised an influence upon the whole *development of the character*. Very likely a self-assured, reckless, "tomboy" manner masks an extremely yielding, passive character, with too little genuine self-reliance.

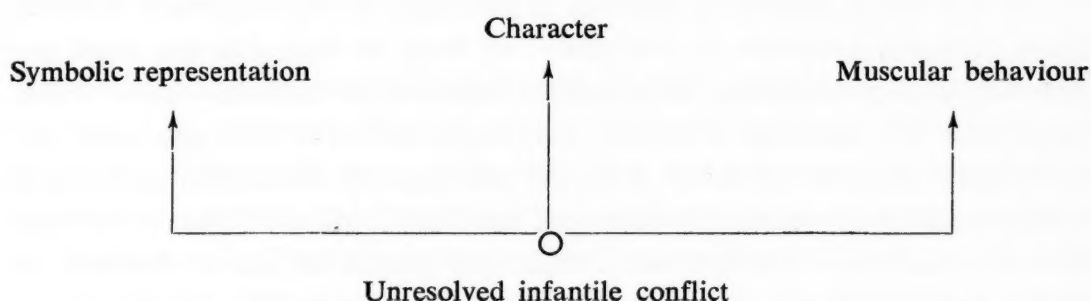
But we find also a third effect: The repression of impulses and feelings is associated with definite bodily, *muscular attitudes*. A person suffering from considerable inhibitions, has muscular and respiratory reactions different from those of an open individual with more freely functioning impulses and emotions. He lives more or less in a state of tension and stands continually on his guard.

The same thing applies to other cases. A boy's active "phallic aggressiveness" is broken and gives place to a passive, anxious attitude, lacking in natural self-reliance and self-assertion. This attitude finds expression, among other things, in extreme shyness. The personality may try to come to terms with this painful shyness in various ways. For instance, the attempt may be made to counteract it by a secret system of grandeur ideas. By this means what is absolutely painful can be repressed, while the rest can be idealized. Shyness is converted into "distinguished reserve" and the lack of normal participation in life into philosophic superiority to the trivialities of everyday existence. By this kind of "distinguished reserve" the painful shyness is held at bay, together with the underlying "feminine" attitude, which, in turn, masks the anxious fear of the original aggressiveness. But alongside of this development of character goes a definite development of *muscular tensions*. There is an attitude to life which is expressed in the person's whole behaviour, and reflected, in a characteristic manner, in certain muscular ways of comporting himself. The connection is also revealed by the way of talking, as is well known. A reserved person has an "immobile face" and a "stiff attitude". And if we study his dreams we find "*symbolic expressions*" of the underlying conflict, e. g. the typical

castration symbolism. Similar phenomena are revealed by analyzing the neurotic symptoms that arise if too great a strain causes an open symptomatic neurosis to break out.

An unresolved infantile conflict has thus various "offshoots", and in a variety of ways it exerts an influence upon later development. Schematically we can distinguish between three different aspects, or lines, of this development:

One line goes in the direction of symbolic representation of the unconscious in dreams, neurotic symptoms, and other "automatic behaviour". A second line leads to formation of character, and a third to muscular behaviour.



These are abstractions, of course. Man is a unity. And character structure, experience, and muscular behavior can not be treated as separate components. But a schematic representation of this kind may nevertheless serve a useful purpose. It can serve as the basis for a clearer understanding of different variations in the technique of analysis.

"Classical" analysis has its essential point of departure in symbolic representation. It concerns itself with the various "*Abkömmlinge des Unbewussten*". Dream analysis plays a central role in it.

It is also possible, however, to start more directly with the different attitudes of character, and carry on the treatment without dream analysis necessarily playing any great part in it. To take the roughly sketched example of the little girl: By consistently working upon her "boyishness" and, later, her yielding character trait, one can arrive at violent affective crises, with a revival of the situation when the child, in her anxiety and helplessness, gave up the direct struggle against the superior power of the adults.

But there is yet a third possibility: One can lay the chief stress on muscular behaviour. By working upon tensions in the oral region and stiffness in the shoulders one may, for example, be successful in releasing automatic spasmodic jerks of the shoulders, giving way after a time to a desperate fit of weeping, which may culminate in a direct revival of the childish

despair felt when the little girl's mother and father let her down and transferred their interest to the new brother.

Thus it may well seem as if there were quite different analytic methods, and "character analysis" and "vegetotherapy" (Reich) have been spoken of as something fundamentally new in psychoanalysis. Actually, what we have are special developments of technical viewpoints which find their natural place within the *global analysis* (Schjelderup, 4) into which psychoanalysis has increasingly developed. Apprehension, character structure and muscular attitude go together, and analysis can use now one, now another point of departure. But in every case analysis has to deal with the personality as a whole. The treatment must be global.

To my mind, therefore, there is in principle no inconsistency between these different methods of analysis – so long as they are not used uncritically and one-sidedly. They can be regarded as different roads which, when they are followed correctly, lead from different starting-points and in different ways to the *same* goal: the reliving and abreaction of infantile conflicts and the resultant liberation of inhibited impulses. What is essential in every analysis – whether one's technique places the main emphasis on dream analysis, character analysis or "muscular" analysis – is a reorientation of the whole personality through the gradual dissolution of the neurotic defence and safety measures, and the abreaction of the helplessness and anxiety that lie behind, thereby bringing about a liberation of the emotions and impulses, with a corresponding readjustment to realities. And probably the most significant factor in this complicated process is, in all forms of analytic treatment, the one which *Alexander* (1) has stressed in his short, but comprehensive survey of "The Development of Psychoanalytic Therapy", namely, "the corrective emotional experience".

I myself have worked for a number of years along the more "classical" lines, in which dream analysis played a prominent part. Later, I made large use of "character-analytic" and "muscular" techniques. And it has tended to confirm the value of analysis as a method of research, that the experience gained in employing these forms of the technique of the fundamental infantile conflicts has in reality been quite in accordance with the experience gained when I employed my earlier method.

Judging from my own experience, one method cannot be regarded as *more correct* than another. Nor is one of the forms of analysis, generally speaking, more suitable than another. In some cases of compulsion neuroses and set "character neuroses", which are hardly accessible to the more "classical" analysis, a "character-analytic" or "muscular" technique may prove more effective. But what is more important than a specific tech-



nique is a high degree of elasticity and tolerance on the part of the analyst. Any dogmatism and one-sidedness in his attitude hinders that liberation and integration of personality which is the goal of the analysis.

The main principle governing the analytic treatment seems, therefore, to be the same, even if there may be great differences as regards the purely technical form of procedure. The corrective emotional experiences in the transference situation play a centrally important role. Accordingly, the essential processes in the analysis are identical, even if the technical procedure for their release may differ.

## II

Expressions like "corrective experiences in the transference situation" and "essential processes in the analysis" are, however, still too indefinite; and it is very difficult for those who have not had wide analytic experience themselves properly to understand the implications of these expressions. In preference to theoretical explanations, some illustrative examples will give a clearer idea of the emotional processes in the analysis – not as *interpreted* by the analyst, but as *experienced* by the patient. A couple of examples of this nature are accordingly given below, and cases have been chosen in which the emotional blocking had been particularly marked and the reactions in the course of the analysis proportionately strong.

First, an example showing how the reaction to the "principle of free associations" can take place.

The statements quoted were made by an intelligent woman of about forty. She had been an *unwanted child* who from her earliest childhood had been under the impression that she was not accepted, and indeed that she was *hated* by a very domineering mother. I quote from a report written by herself:

"I was 36 years of age when I began the analysis. Personally I had no knowledge of this kind of treatment, except that I knew that it was a treatment for mental disorders that one had contracted in a difficult childhood. I thought that a neurosis was due to one or several specially difficult conflict-situations at the age of 3-4 which one could not remember oneself, and that one got rid of the neurosis when these situations had been brought back into one's consciousness. From the little I had read and heard, I thought that the analysis consisted in the main of an effort of memory, which it was the analyst's task to promote, and that everything depended on whether by some mysterious conjuring he could succeed in performing this miracle with my memory. So during all the first period of the analysis I was continually in fear of not being able to recall the conflict situations which had occurred farthest back in time, and that consequently I should not be cured.

When I began the analytical treatment I knew hardly anything about my feelings and reactions, and absolutely *nothing* about what they ought to be. I only knew that something must be wrong, and that my suffering had become more and more unbearable with each year that passed.

I have now been analyzed 5½ years, and the change is so great that it begins to be difficult to recall what things were really like before.

It was dreadful to go and be analyzed, especially at first. It was also a difficult situation for me. Up to then my thoughts when I was with other people had chiefly been concerned with what the *others* wanted and expected of me. Now it had all to centre in myself. I went to each session with an incredible though unconscious dread of being criticized and scolded. Whatever I said, I felt that there was something wrong with it. The result was that I often became so strained that I couldn't think at all. But *that* was wrong too. It meant that I was wasting the analyst's time, and he must think me slack and "cussed". In a panic I make some remark about the weather, perhaps. "But that is frightfully silly", I say to myself. What on earth shall I think of? The analyst is just sitting there and waiting for me to think aloud. In desperation I venture a remark about a picture on the wall. Then the thought flashes upon me: "No! I'm sure I said that last time, he must think I'm a fool, perhaps that I'm mad. I wonder whether other patients say things like that!" But not one of these anxiety-thoughts that flash through my mind at such breakneck speed do I utter aloud. To say what I'm thinking about must mean saying something coherent and sensible. People who say something incoherent, absurd, and illogical are insane or altogether impossible.

I kept an eye on the clock, and before the hour was over I jumped up in fear that the analyst would be angry with me for not noticing the time. Then he said discreetly and gently: "I'll see to the time, so you needn't think about that." "He is kind!" I thought, but on the next occasion I was afraid all the same, and wanted to keep an eye on the clock; but that too was wrong now, for he had told me he would see to the time. But what if he forgot himself and lost his temper? – How could I look at the clock now *without* his seeing me? . . .

And then I always lay as quiet as a mouse. I had no idea that I could move. Besides, I had to keep out of sight as much as possible, so that the analyst should not see how horrid and ugly I was.

If I wanted to go to the lavatory, it never occurred to me that I could possibly ask to go. So at first I ran off to a friend nearby, but I could only do that in an extremity.

When I eventually became so brave that I could ask to go to the lavatory during a session, this aroused a jumble of anxiety thoughts: "Perhaps he thinks it nasty that I go to his lavatory; perhaps he thinks I'm using too much paper; perhaps he thinks I'll be away long; perhaps he thinks it unrefined that I have been there without washing my hands, but he hasn't asked me to wash them and then I can't ask to do so", etc.

Then, if I came in again and he asked what I was thinking about now, I would answer "Nothing", which was true. I was so accustomed to my mind working in that way that I imagined all polite and considerate people did the same. It had nothing to do with "thoughts", being just as natural as moving one's feet in walking.

As soon as the session ended I put on my coat and hat quickly and hurried out; for if I took too long about it he might get annoyed. Then I attended to my ruffled

hair and my red eyes on the steps outside – but not just in front, for perhaps he might come out and find me there, and then he would ask what on earth I was doing, and be furious.

If I came a little too early to the session and walked about outside, I was afraid he would see me from the window and be angry with me for walking about outside his house.

As it was so difficult to talk in the analytic sessions, I began to write down thoughts which came to me just after a session and learned them practically by heart; but the *fact* that I did this and the *things* I wrote were both so silly that he must not on any account get to know; it was easy to hold my tongue so as to avoid giving myself away, and I did it quite unconsciously.

Not a single thought emerged without being checked up, and yet I was indescribably afraid. It was worst when I had nothing particular to tell. In that case I was so afraid that some unweighed word would slip out, that I felt as if I were about to throw myself down a precipice.

When you check up on your thoughts like that and every muscle in your body is tense, you really tell things like a spectator looking at yourself; and during the first years that was the only way in which I could say anything.

I had it so fixed in my mind that whatever I said was wrong that I was in the seventh heaven with relief if, for example, I could tell about some occurrence in my childhood, which any normal person would consider extremely shocking, and which impressed the analyst in the same way. And how understandingly and sympathetically he talked about it, without a hint of criticism. He was supernatural!

But on the next occasion I was just as afraid of criticism. He might have changed his mind, and perhaps he thought now that I had been unreasonable and naughty and bad. However, he was just as understanding and sympathetic this time. It was incomprehensible. But it couldn't last: I must be careful. Of course he was kinder and more considerate and tolerant than all the others, but should I happen to say something *he* disapproved of, then . . .

I did not believe all his assurances – that is, I believed them with my reason but not with my feelings, and it is the feelings that really matter.

It is terrible to be analyzed, but what is infinitely worse is to be *alone* with a neurosis of this kind.

The terrible thing about the analysis is the fear of being treated in the same way, and of experiencing the same anxiety, as when one was a child. And since I myself had the feeling that I was a worse, more inferior, stupid and unpleasant person than anyone else, I felt that that must be the opinion of the analyst as well. This was not something I understood all at once, but I reacted as if I were like that – it was inherent in my whole make-up.

I remember that when I started being analyzed I hoped I should never meet him in the street during or after it. That such a distinguished person as he would *speak* to me except during the analysis was *unthinkable* of course; but if I met him in the street he would remember all the foolish things I had said and his contempt would be reflected in his face, and that would be too humiliating. There was constantly this indescribable dread of what might happen. Analysis is a continual alternation of heaven and hell.

Hour after hour, for months and years, I go on talking about myself, my difficulties and my worries, my anxiety and my bitterness, and am met with a patience



and goodness and understanding, a seriousness and sympathy which I realize must spring from personal qualities that are very uncommon. I do not meet with any of the things I expect and fear – not so much as a single phrase of the commonplace kind.

If there are signs of tears he *doesn't* say "That's nothing to cry about." If I say I am bitter about all I have suffered, he *doesn't* answer: "You must not go on brooding on that or you will never get well." And if I say I am so tired, he *doesn't* answer: "You ought to be out a great deal and go for long walks," etc., etc. The kind of answers one so often gets from friends and acquaintances – they mean so well, but on me it always had the effect of a severe criticism. I have always thought that those answers meant "You must pull yourself together."

But how can you pull yourself together still more, when every day has become one long state of suffering and all the sleepless nights of anxiety are like a nightmare? In such a case you have a desperate struggle to keep going at all.

But how can the analyst understand all this, and how then can I have so much anxiety still? In one session it seems too good to be true; in the next one has forgotten all that was good. Then it is good once more, and then bad again.

As time goes on I realize that the analyst is two different persons. One part of him represents the home of one's childhood – the world – as I experienced it until the analysis began. The other part is a person from an entirely different planet. And there I find tolerance, freedom, safety, and conditions for a fully developed life, which I am gradually getting to see that I had not imagined possible. And I understand at last that the analysis is meant to give this person from an unknown planet control of my consciousness. It is this person that I meet in every analytic session, without exception or disappointment, taking in hand all the anxiety and sense of guilt, the delusions and the distorted attitude to life till I gradually muster enough courage to give myself away, to abandon all the self-defence which finds expression in such tremendous muscular tension, and at last dare *feel* both what is evil and what is good.

It is terrible to go and be analyzed, but it is also the greatest and the best experience of my life – it depends upon which of the two persons I feel I have before me.

Unfortunately it is very often the "first" person who receives me and begins the session, while it is the second one who usually finishes it and says good-bye.

I dare not say *good-bye* to the first, may-get-angry person – no, not, yet; but that is the part I would really like to square accounts with – saying good-bye to him for ever."

These observations reveal many things of psychological interest. Only one point, however, will be commented on here.

A characteristic "on the watch" attitude, curbing all spontaneous impulses, and having its physical expression in continual muscular tension, is clearly manifest. Whenever an impulse or affect threatens to emerge, the tension increases automatically into a more or less complete rigidity, and often into a painful cramp in certain muscles. The muscular tensions and respiratory changes connected with them are the outward, visible expression of a *blocking mechanism* which hinders not only thoughts and memories, but affects and impulses, from rising into the individual's con-



sciousness. At first the patient was quite unaware of this marked tension; it was only little by little that she became conscious of it in the course of the analysis.

It is this automatic blocking that makes it so difficult to establish true contact with a neurotic and effect a change in his reactions. The above description gives a good idea of the great *difficulty of learning from new experiences*, where fundamental neurotic reactions are concerned. Again and again the same dread of the analyst's supposed disapproval returns, notwithstanding the constantly repeated experience to the contrary. Every attempt to "reason with" the patient is unavailing. The change only comes little by little, as the underlying anxiety is slowly dissolved.

The process which takes place here in the analysis may be compared to the *reconditioning* which has been employed to remove anxiety in children (Jones, 2). Seen from one point of view, analysis may be regarded as a gigantic experiment in reconditioning.

This, however, only describes *one* aspect of analysis. The process as a whole is far more complex.

In consequence of the far-sighted patience and understanding with which he is met in the analysis, the patient acquires, little by little, a feeling of confidence and security which enables him in some degree to get rid of his watchful attitude and relax his defence-mechanisms.

As the sense of security gradually increases in this way, one would expect a constant improvement in the patient's condition and in his relation to the analyst.

Generally, however, the course of events is altogether different. For the more the patient's security grows and his watchfulness weakens, the more do previously blocked feelings and impulses increase in urgency. At first they only appear in flashes, later, and often in violent paroxysms, they break through and at times bring on severe emotional crises. These crises may vary in nature and be dominated by different feelings: anxiety, anger and revolt, desire for contact, frustration, humiliation. In such periods of the analysis the whole structure of security and of confidence in the analyst that has previously been built up, may seem to vanish. On the contrary the anxiety, rage, and frustration become associated, in transference, with the analyst himself. At the same time the identification of the analyst with the patient's father, mother, etc. is more clearly manifested. And a strange *experience of being little* may develop, not in the form of ordinary *recollection* of something which happened in early childhood, but as a direct, emotional *living over again*.

By way of illustration I will quote some fragments from the analysis

of another female patient, J. L., who suffered from a severe compulsion neurosis. She always felt that she had to prove that she had not killed someone or done something else that was wrong. For that reason she never dared to go anywhere alone. Further particulars of her neurosis and the therapeutic results of the analysis have been given elsewhere (5, p. 125 ff.).

In her temperament she exhibited a mixture of a certain self-assurance when in the presence of strangers with, in general, a self-effacing, exaggerated considerateness. Those who had known her in her childhood said she was an *unusually good and submissive child*. Nevertheless her childhood had been very unhappy. Her father was severe and intimidating, while her mother was cold, unloving and unfair. The mother had lavished her love on an elder sister of the patient, and the latter felt that she was neglected and hated. That the mother did show very one-sided favoritism and that the patient really was unwanted, has been confirmed by independent witnesses.

The first period of the analysis was characterized by great caution and anxiety. The patient was mainly taken up with thoughts of how nasty she was, and how horrid the analyst must think her. She was quite exceptionally hushed, retiring and shy. Gradually, however, as she felt safer, she began to react against her own passivity and submissiveness. And the first great outburst of affect was marked by a spirit of revolt and aggression.

Especially interesting, in connection with her distressing obsession that she was guilty of the death of someone else, were the violent rage and hatred which came as a spontaneous reaction – a revolt of almost sinister intensity – when she began in earnest to admit to herself how unfairly she had been treated as a child and how repressed and crushed she was then:

“I have been filled with burning hatred – I hate everybody – I have hated you – last night I only raged – I didn’t sleep a wink – I must kill – I wished that father and mother were dead so that I could be myself. – I can’t stand this respectable person any longer . . . it would be fun to go on the spree with hoodlums, boat ruffians, dirties . . . I just can’t go on being respectable! – Now it has come, the terrible exposure I’ve always dreaded, I, who’ve been such a respectable person. – I want to be like Kürten,<sup>1</sup> respectable in the daytime and doing the most awful things at night. – I have been so afraid of all kinds of murderous weapons, but in reality I want to use them – I imagine myself so vividly in murder situations that I think I have *committed* murder – I must experience this terrible thing – I am curious to see what will happen – it comes from time to time like an electric shock. – There is such an excess of opposition in me . . . When I was eleven I had obsessive ideas that I must go to the churchyard and dig up the corpses and maltreat them and devour them . . . but in that case everybody would

1. The notorious German mass-murderer. The Norwegian newspapers were also full of his misdoings at one time.

cast me off – I didn't dare to lie facing the side where the churchyard was – I had to turn away. – I have never shown any sign of protest – it was no good – but inside me there was a sort of opposition – though everybody said I was such an extraordinarily good and submissive child."

But after the rage and hate have to some extent found their outlet, other feelings forming the background of the protest emerge and explain it: the longing for contact and to be accepted, and violent disappointment at being rejected. It comes at first as something quite topical in the course of the analysis, a severe crisis in connection with the manifestation of positive feelings, longings, the need of kindness: "Rather compulsion and suicide than show any feelings" as she says herself. And when the feelings come out all the same, this is experienced as though the *analyst* has deceived and failed her, just like her mother, who wouldn't have anything to do with her. And the frustration reaction becomes violent. I give a couple of characteristic outpourings in a letter I had from her:

"Thank you, now it's all so splendid, professor! – What the *devil* is the good of all this acting? Didn't things go as I said? *You*, yes, *you* are the one who has lured me into nothing but muck! . . . What in hell does it interest you that I wander about the streets for hours in the blackest despair, while you just laugh, up there in your snug sitting-room! Did you *still* think that my experience of life was not complete? You must still carry on – oh! You cursed satan, *how* I hate you! *You*, exactly like mother – I had to go on and on *imploring* her till doomsday, and I could shriek at her still; but the only result was banishment and a *black* cellar or an ice-cold room where she didn't have to see me or hear that I was crying! – "Yes, if you will be good you can come in!" "I will be good, I will be good." – *Mother* also wanted to hear that I loved her! . . . I have only begged and *given*, all my life, and now it has come to me again. – You too have lured me into giving myself away. – Merely in order to smile at me. – I can't and won't stand for it any longer – it is full up; *you* got what you wanted, but now I am clear in the nut *at last*, *at last* – I've cried myself out, and I've lived the *whole* of my life over again. . . . Mother loved to torture me – threaten me into submission. – So do you – so do you – so do you – so do you, do you hear what I say?"

More and more strongly she feels that beneath the emotional blocking and the aggression and the revolt lies a fathomless despair:

"I will only cry, cry, cry – I must do all that I can to repress the despair, for if it comes up it only meets with cruelty and scorn. *You* are not kind, either, when that point is reached! . . . Everyone is wicked – mother so often said that I ought never to have been born."

Then, in a crisis, not as a pallid memory, but as an experience that is lived over again, comes the conflict of childhood which she herself feels to have the chief significance for her despair and hatred and anxiety, her sense of having no justification for her existence: the desperate struggle to assert herself, to be accepted, to be able to show and receive affection –



and then the defeat, the complete rejection, the feeling that others were always preferred, that her mother did not want her and her father cared more for others.

All this culminated in a particular episode which was a turning-point in her development. I will let her describe it herself:

"I have had what has surely been the most frantic and the worst night of the whole analysis: it came in paroxysms and with intolerable tension: the full realization that mother rejected me . . . I suppose I was between three and four years of age – there was nothing dramatic – but I staked *everything*: "*Listen to me, mother!*" – Mother was talking to my sister then and wanted to be quit of me – she didn't slap me; but I felt the complete rejection and her hostility. I went out – I *would* not let it hurt me, but it came over me all the same; I went up into my brother's room out of the way, and cried and cried and cried till I was worn out, almost unconscious – then came the reaction – I became callous: "Nothing matters" – I remember so well that when I went out again, the only expedient I could see was *not to need anybody* – since then I have been in a panic lest I should be fond of anyone – everything was so gloomy -- I have been so afraid of that gloominess – I *had* to be gay, otherwise I would be quite alone – I felt I had become quite impossible . . . I have raged against you for dragging me into this again . . . It is so strange to experience oneself as such a tiny child – before one can think, when one just *is* in dependence on mother. Not till quite recently in the analysis have I experienced myself like that, as quite little. This has got to the bottom of it all . . . all that wishing to be a man, and the sexual difficulties, is secondary, a result of the destructive effect of my rejection."

Other serious conflicts came later. But the patient returns again and again to this episode as fateful: it was then that everything culminated. She *had* to rid herself of all feelings and then pretend that nothing was wrong. From then on, she became another person.

She could not try to get contact, she felt she was discarded and so she thought there must be something awful the matter with her. At the same time the foundation was laid of the deep, unconscious sense of guilt, which subsequently manifested itself in the compulsion symptoms. She describes the connection as follows:

"I *hated* mother because she had rejected me – I could have burnt her, set fire to everyone – there wasn't a thing I wouldn't have done – later, under the influence of the compulsion, I had to prove that I had done nothing wrong – but I had such a sense of guilt for wanting to do it – I can see the connection now."

When the sense of guilt has been reconditioned, she begins to realize how unnatural her whole personality was before:

"The judgment which always hangs over my head begins to disappear – I remember now how I built up my personality . . . I assumed a brazen, boyish character – I became reckless, I must not show the least weakness, no one must know what I was like – for I was worse than all the others . . . I lived as it were in a vacuum – every-



thing was so far away – the judgment hung over me all the time I was being analyzed too – the analyst's silence was so awful – *Do speak out instead!*"

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The emotional reactions evoked in analyses are, of course, individually very varied. But there are also essential points of similarity, which emerge with particular clarity in protracted, deep analyses: the violent infantile revolt, the impotence and helplessness, the craving for contact, love and protection, the profound frustration, the anxiety. For purposes of comparison I will quote a couple more statements made by the patient whose description of the actual analytic situation and the reaction to "the principle of free associations" has already been given.

"One day when I had made some progress [in the analysis] I relaxed a little at home, and then I felt severe anxiety . . . and I felt I was the *size* of a one-year-old child, and was in frantic terror of being slapped. And I wondered afterwards how I could feel so small and helpless that I even seemed to have the body of a little child."

"What struck me . . . was how *impervious to reason* one is when in such a panic of fear. . . . Seen from my anxiety-viewpoint *you* are grown-up, you know everything, decide everything and do what you like – with just a wave of your hand you can command the whole world to be completely subject to you . . . You have taken over my mother's role, deciding whether I shall exist or not – and when I get into this state of anxiety I am *not* to exist . . . In the violent condition of agitation I got into, I was altogether changed, *felt* that my emotional life has been that of a terrified child – I have only had the skin of a grown-up, and it has all been words and gestures learnt by rote."

Alternately with such attacks of anxiety will come a violent mood of revolt.

"It gives me an impotent feeling of bitterness to discover that I have never been able to be myself in any single respect . . . I was so filled with hatred of the whole world and Fate after the session today that I thought there was no escape but an eternally unquenchable hate and revolt . . . If only I could isolate myself completely from all emotional contact with other people and just *hate* for all the harm they have done me. . . . Can't you do this for me, can't you fix the analysis in such a way that I shall *never* need anybody, *never* need any help, *never* need any kindness?"

But after the revolt, which during the sessions could take the form of screaming, hitting out and kicking, came a tremendous craving for protection and love.

"The nightmare of hate in which I have been sunk has begun to disappear. I don't recognize myself when I think of it. It is as though I have been intimidated to descend into an odious, wicked world where everything is vulgar and hard and heartless and cold, and where one must fight tooth and nail for life if one is to survive. – It seems impossible that it is I who have engaged in all that nastiness, talking vulgarly, meanly, hitting, kicking, screaming and using bad language.

Like a possessed imp of satan I felt powerless, full of poison. Now it all seems so indescribably tragic to me. It is like being witness of my own hopeless struggle for independence and self-respect. Yet somewhere it feels like a small victory. But I am still lonely, sore and helpless and full of longing for affection!

Some time ago I fancied that nothing could be so lovely as to be so little that I could lie on a mother's breast; I felt a tremendous craving to suck and sleep, to lie with my whole face buried in something soft, to have something soft and warm in my mouth. But now even that is not enough to give me a sense of security. No, I wish the loving person could take my whole body and swallow me, so that I could lie down in a soft, warm, moist stomach, never needing to come out again, for then I would be safe for ever. Then that person could never leave me, so that I was alone and afraid; and then I would always have contact. And if that person were happy, I would be happy, and if she were sad and unhappy, I would be too; but that wouldn't matter, for after all I was with the only person I was fond of and who was fond of me. And safest of all, I knew that should that person die I would die too. It is the thought of that lurking anxiety which prevents the security of being a baby from being enough. The only real release from anxiety is to be taken inside another person."

### III

An emotional "break through", accompanied by the revival of the underlying conflicts, is often a great relief, but it does not in itself effect a *lasting change*, for to begin with, the reaction is no different from the one far back in childhood.

Only gradually does a real *rectification* take place. This rectification is a very complex process: reconditioning of earlier emotional reactions, working through of infantile cravings, admission of new feelings and fancies, and the understanding of connections which have previously been inaccessible to the patient's adult reason. Actually what takes place is a complete reorganization of the field of personality, as the dynamic conditions are changed.

A decisive part is played by the change in the patient's spontaneous *self-feeling*, and together with this the change in the spontaneous *relation to other people*.

"Strange things happened yesterday," the patient I. L. relates. "It came on so quietly. At first it was exactly as if I were dead – but then, for the very first time, I began to realize what it means to be oneself, to rest in oneself . . ." Some time after this, the same patient says: "It has always been *the others* – it was as if they alone had the right to exist – now it begins to be *we* instead of *they* . . . When that comes, everything is changed – there is a bursting joy, the circulation of the blood becomes altogether different, I get violent palpitation, can hardly bear it. Connected with this is the fact that other people cease to be such supermen. Now "*we instead of they*" has become a sort of formula with me."

"The first time the word *peace* cropped up emotionally in my consciousness," another patient relates, "it felt like quite a new experience. It only lasted a few seconds – and immediately after, the analytic session came to an end. But that moment made such an impression on me that I went on thinking about it for a long time after I returned home. It was only then that I realized what I had felt in those few seconds.

I compared the word "peace" with "security", and felt that it was something different. I had long felt secure (to a certain degree) with the analyst, and experienced it in this way: The analyst was kinder and better than all the people I knew, so I was safest with him, and he could protect me from all external danger, so that no harm could befall me, *but* – in dealing with him I felt that I must be attentive, on the watch, in spite of everything be considerate in every situation, never be altogether myself, even for a moment. I couldn't shut my eyes, for instance, and just rest a moment, when I knew he was looking at me, for that would be rude and inattentive, and then he would not like me, perhaps even laugh at me. Such thoughts were at all times coursing through my mind.

In the few seconds during which I experienced peace – as though all thought-activity stopped – *for the first time in my life* I did not need to be on the watch, as no dangerous world existed, body and soul were both at rest – for I could be myself – while I lay with closed eyes and felt independent of everybody – *even of the analyst* – I was beyond the reach of scorn.

At one time, earlier, I had visited a friend who had had a baby, and saw the little child at her breast – how it lay snuggled up to the mother, sucking, stopping now and again, just lying there and resting with a sense of well-being. On that occasion I thought: I myself have never felt as secure as that. I always felt a stab in the heart when I saw that mothers were affectionate with their children. Yet in that brief moment, when I myself experienced peace, I felt something of the security of an infant in arms, and know afterwards that the ability to experience complete security is what creates confidence and self-feeling – which, I imagine, is the first step to becoming *grown up?*"

In contrast to the violence of the emotional crises which may be associated with the beginning of the "break through" of repressed affective and impulsive life, there is the hushed, unsensational character of the new experience that emerges after the reconditioning.

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The slow reconditioning, the phases of emotional "breaking through", and the subsequent rectification, with the *maturing of the emotional life* that accompanies this, throw the entire personality into the melting-pot. Often, however, it takes a long time – even after the termination of the analysis – to mould the attitude to life which corresponds to the changed dynamic conditions of personality. There are very great individual differences here; but in a certain number of cases at any rate it is as though one had dislodged a landslide of new impulses and emotions which need some time to come



to rest in a quieter place. The necessary achievement of maturity is only arrived at gradually.

To illustrate this, I will quote some statements made by one of my patients who was subjected to close study *before, during, and after* the analysis, by a well-known Norwegian psychiatrist, the late *Haakon Sæthre*, head of the Psychiatric Department of Ullevaal Hospital, Oslo. (See Sæthre, 7, p. 264 f.). She was a thirty-year-old woman who "ever since she grew up had felt psychically broken down, and in recent years incapacitated from working" (Sæthre). After two years' treatment by suggestion and medicine under Sæthre's care without any result at all, he sent her to me for analysis. Immediately after the analysis, which lasted a little more than a year, she wrote to Dr. Sæthre:

"I can not very well explain my feelings at the present time, it is as though nothing has settled down properly yet . . . Everything that was withered and dead in me has come to life . . . with a sudden, violent force, and I am searching as it were for some outlet for all this new energy . . . Yes, I seem to be standing here now, very much alive and bursting with vitality. I can never remember having felt like this . . . It is a strong and a strange time . . . I am unable to describe anything quite clearly, but perhaps you understand all the same how I feel – perhaps you are conscious of the great change that is laying hold of me."

The slightly strained and over-excited state she was in to begin with after the analysis gradually calmed down, as her increased ability to work furnished an outlet for her released powers (as a teacher of music). About 1½ years later she writes:

"I had formed the habit of always living outside of life; the thought of taking up life's struggle whole-heartedly always seemed so impossible to me. But it is just that – the desire to live life in its entirety, which has become so overwhelming in me – using all one's powers to the utmost extent, and standing with both feet right in the turmoil of life."

Thus the full effects of analysis in changing the personality appear only gradually, and often not until a good many years have elapsed since the termination of the analysis. Moreover, in evaluating the lasting effects of analysis in changing personality it is obviously not just the processes of the actual analysis that have to be taken into account, since a decisive part is played by the total interaction of "internal" and "external" changes. The changes in the way an individual reacts, as the result of being analyzed, involve on their part changes in the external life-situation, which in turn react upon the individual himself. It is a well-known fact that we have to take account of a *circulus vitiosus* in the development of neurotic character, as *Schultz-Hencke* (6) pointed out so clearly. In the analytical process of healing, on the contrary, we have to take account of a *circulus*



*fructuosus*: the personality changes during the analysis lead to a reorientation of the life-situation, which in turn has the effect of reducing the conflicts that tend to keep alive the neurosis. In this way the initial personality changes are reinforced, made lasting and enabled to develop further. The reorientation of the life-situation need not involve any drastic external change, such as divorce or change of occupation, in order to have decisive importance. A marriage, for example, can become psychologically an essentially different life-situation if one of the parties who used to be self-effacing and too yielding becomes independent and normally self-assertive.

Analysts not uncommonly make the mistake of thinking that the therapeutic process is confined to the analytic sessions. *Alexander* (1, p. 19) has expressly dissented from this view: "Any psychodynamically well-trained therapist . . . would agree that under the influence of the emotional and intellectual experience on the couch, the patient becomes capable of having beneficial experiences in his life – at his office with his colleagues, superiors and inferiors; with his wife or his lover; with his children – and that the therapeutic achievements result in part from these life experiences."

If one would understand the character changes due to analytic treatment, it is important to see that what we have here is a *circulus fructuosus* which continues even after the analysis has finished. The analysis *initiates* a process of personality change which often continues for years. "I wish", wrote a doctor about 3½ years after I had had him under analytic treatment, "that you could have observed me during the last two years. I can say quite definitely that the full effect of the analysis is only now revealing itself. The more immediate, initial symptomatic results pale in comparison with the later development."

In view of the evidence therefore it would not be right to ascribe the *whole* of the personality change in a favorable direction, as seen in the follow-up, to the analysis alone. As a critically minded lawyer put it: "The analysis was certainly an important episode in my life: it opened my eyes. But the analysis forms one part of life as a whole. It is not that alone which has made me freer, more mature and more independent." Nevertheless, the former patients quite see the essential bearing of the analysis upon the change that has taken place in them, even in cases where new human relationships, new activities, and interests, play a large part in making them feel "different" today. For instance, one writes: "I take part now in various public activities, have given a lot of lectures, started a sports club, am secretary of . . . society, am in the Home Guard, have built up the institute from 2 posts to 5 posts at present, etc. That is some-

thing that could never have happened if I had not been analyzed!" Another says: "I don't think I should have begun to paint if I had not decided to be analyzed, and it means everything to me now." For the rest, many feel a certain distaste for raking up the old difficulties and frustrations. One writes: "I was like a ship at sea without a rudder. Now I can scarcely recall what I wanted analytic help for. Of course I do. But I don't want to rake it up any more. I feel well. Just that."

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To enter upon a closer theoretical discussion of personality would be outside the scope of the present article. In a later publication, however, I hope to give a fuller account of the processes involved in a global analysis, and to discuss in greater detail the relationship between these processes and the lasting personality changes observable after the analysis.

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# A STUDY OF VISUAL MOVEMENTS DETERMINED BY FORM, COLOUR OR BRIGHTNESS

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The experiments that will be described in this article were planned in order to elucidate some of the psychological laws that must be assumed to apply to the Rorschach test. In this test, it is of the greatest importance to be able to decide whether the subject interprets the figures on the basis of their form or colour, and it is often confusing to question the subject on this matter, as he is liable to report on a more highly processed mental entity than the one which he perceived when first interpreting. A series of experiments was therefore planned with the aim of ensuring that the subject would experience a movement in one direction if he kept to colour, but an opposite movement if he primarily experienced formed entities. The stroboscopic movement as it is seen or perceived will be designated the experienced movement. After the experiments had been completed, my attention was drawn to works by Thurstone (1952) and Schmidt (1936) based on the same principles.

Bruno Schmidt employed a circular plate in which holes of two different shapes were cut. By means of an ingenious system of red and green lamps, he illuminated the holes from the rear in such a way that subjects saw movement in one direction if they kept to colour, and movement in the opposite direction if form dominated.

Thurstone repeated Schmidt's experiments, obtaining the experienced movement by means of four epidiascopes with synchronised shutters, later making films where the experienced movement could be determined by either form or colour.

Schmidt and Thurstone restricted their experiments to relatively few colours and forms. The apparatus used by the present author permitted as many changes in the variables as might be desired and thus occasioned experiments which could throw light on the importance of the various components (form, colour and brightness). Figures cut out of coloured paper and presented on a grey background were used.

After a series of pilot experiments, a square (7 mm  $\times$  7 mm) and a circle (diameter 8 mm) were selected as the most suitable figures. Triangles and other figures whose sides formed angles pointing in one or another

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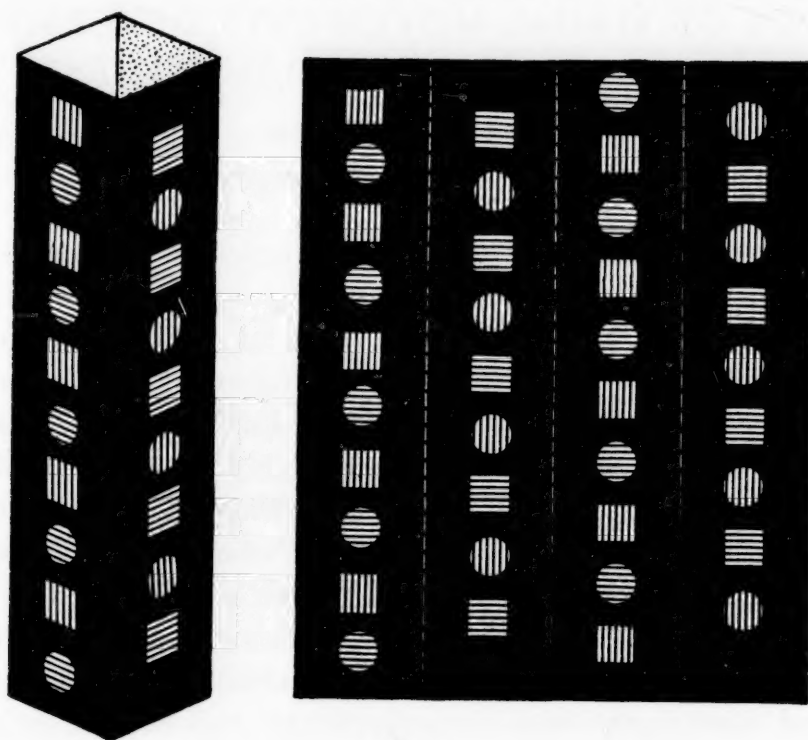


Fig. 1.

direction were not included in the final experiments, as the preliminary investigations indicated that pointers might influence the direction of the experienced movement.

Zimmermann's grey papers nos. 1, 5, 9, 12, 14, 23, 25, 26 and 30 were used for grey figures and background, and will in the following be designated by the letters *a* to *i*. Their brightness was controlled at Denmark's Polytechnical High School's illumination laboratory, where Mr. K. O. B. Jørgensen found the following values as percentages of absolute white using G. R. Baumgartner's reflectometer:

Grey paper	Total reflection in %	Grey paper	Total reflection in %
a	76	f	11
b	38	g	9
c	24	h	8
d	19	i	4
e	16		

The coloured papers were controlled at Copenhagen University's biophysical laboratory by Dr. B. Buchmann, who determined their trichromatic plane coordinates. In the diagram, N is international normal white, L is the daylight incandescent lamp used for the experiments, O is white drawing paper illuminated by the lamp, and the numbers 2 (red), 5 (yellow) and 8 (green) show the position of the colours in the CIE diagram.

The circles and squares were pasted to pillars 10 cm high, the base of



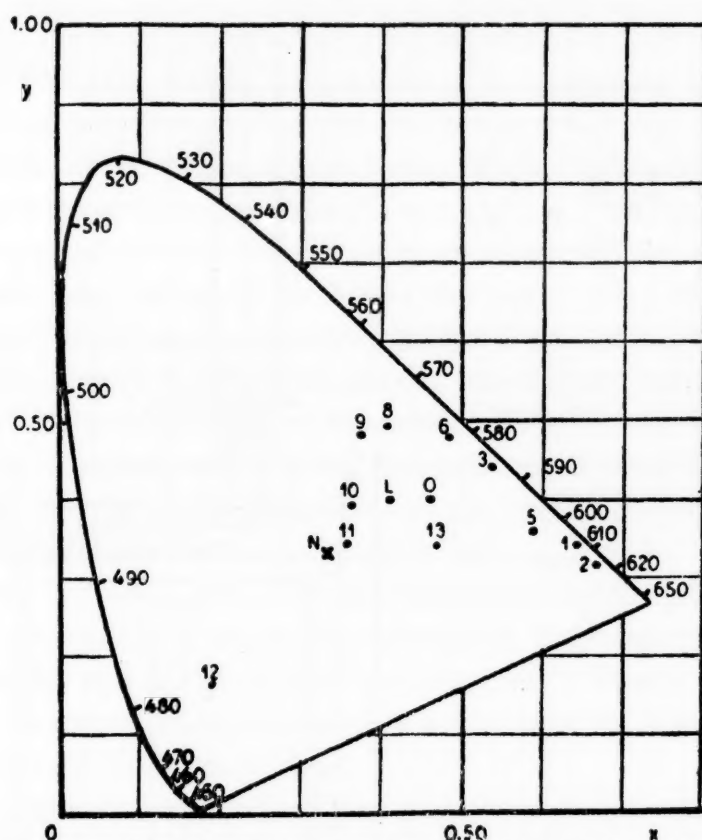


Fig. 2. CIE diagrams in trichromatic coordinates for the coloured papers employed. N: international normal white. O: white drawing paper under the daylight incandescent lamp. L: daylight incandescent lamp. 1-13 coloured papers under the daylight incandescent lamp.

which was square, having sides of 2 cm. The figures were so affixed that when the pillars were moved in jerks, one saw e. g. a movement downwards if one looked at the colours, and an upward movement if one looked at the forms. Figure 1 shows a pillar and the positions of the various figures.

By means of the above-mentioned letters (greys) and numbers (colours) the 18 pillars employed can be characterised with regard to figures and backgrounds as below:

Pillar no.	Background	Figures
1-2	d	a & i
3-4	f	b & c
5-6	g	c & e
7-8	f	2 & 8
9-10	g	2 & 8
11-12	h	2 & 8
13-14	i	2 & 8
15-16	i	2 & 5
17-18	i	2 & 8



proved to be the best suited for assuring experienced movement. The speed of rotation was kept constant by means of a variometer connected to the axle of the electromotor, and a variable resistance which made it possible to regulate the speed of the electromotor. The windows of the room were covered, and the only source of light was from a Philips daylight lamp of 100 lumen placed 40 cm over the table on which the apparatus stood, the centre of the lamp being 25 cm above the upper edge of the pillar. The apparatus and lamp were completely hidden from the subjects by a screen covered with *b* grey paper. The subject viewed the pillar through a slit  $8 \times 1.5$  cm. cut in the middle of the screen. This slit was covered prior to commencing the experiments, being first uncovered when the experimenter had ensured that the apparatus rotated at the correct constant speed.

The instruction given to the subjects was:

"In a few moments you will see something moving behind this screen. You are to tell me if you can see the movement, if the movement is upwards or downwards, and anything else you may see". When the subject had completed his report, the apparatus was again screened from view, and then stopped while affixing a new pillar.

It was possible to see upward and downward movements. Experiments were not carried out with reference to horizontal movements, however, as it could be feared that movements toward the right would be favoured by reading practice. As it was feasible that some of the subjects might find it easier to experience movement upwards than downwards, for example, the pillars were so constructed that a subject whose movement perception was dominated by, or who preferred form would see a downward movement with even-numbered pillars (2-18) and an upward movement with odd-numbered (1-17). If colour dominated, pillars 2-18 were experienced as moving upward, and 1-17 as moving downward. Approximately half the subjects were shown pillars 2, 3, 6, 7, 10, 11, 14, 15 and 18, the other half being shown 1, 4, 5, 8, 9, 12, 13, 16 and 17. This arrangement took into consideration the possibility of disclosing a tendency towards preferring the one or the other movement, as well as that of possible preference for movement upward or downward being related to the direction of the first movement experienced.

Before commencing experiments, the subject was placed in a chair, and rested his chin in a rest which was exactly 125 cm from the front side of the pillar.

The students who in the following are designated the control group were all subjected to a number of group tests and an individual two-hours interview prior to the experiments.

The patients were selected at random from 3 homogeneous groups of hospitalised cases on the basis of their case histories and information received from the physicians attending them. The 3 groups were: excitable, calm and indeterminable.

There was presumed to be a noticeable difference in the perceptions of form and colour, matching the emotional differences between the patients and the control group.

With regard to the results for the control group, the pillars were first divided into two groups according to brightness. The group comprising those pillars where there were greatest brightness differences between the figures (pillars 1-6, 15 and 16) gave the following results:

Pillar no.	Number of movements		
	up	down	undecided
1	0	11	2
2	11	0	1
3	0	11	1
4	9	1	3
5	0	11	2
6	12	0	0
15	0	12	0
16	10	0	3
Total	42	46	12

The group comprising the remaining pillars (7-18 with the exception of 15 and 16) gave the results below:

Pillar no.	Number of movements		
	up	down	undecided
7	0	10	2
8	8	1	4
9	2	4	7
10	7	1	4
11	1	6	5
12	5	1	7
13	2	4	7
14	6	1	5
17	3	3	7
18	4	2	6
Total	38	33	54

The number of movements upward and downward is about the same for all tests. Decisions as to the direction of movement seem to be more certain where there are comparatively large differences in brightness between the



figures, only 12 out of 100 answers being undecided. Decision is more difficult where differences in brightness are small, as there are 54 undecided movements out of a total of 125. It appears that it is about equally easy to perceive upward and downward movements, and that there is no preference in this respect. This is confirmed by the individual protocols, as few, if any of the subjects manifest definite tendencies toward preferring a particular direction of movement.

Turning now to examine the interdependency of the variables form, colour and brightness, we may begin by matching form and brightness, using pillars 1-6, 15 and 16. In the table of results below, the reported experienced movements are denoted according to the determining variable:

Pillar no.	Form	Brightness
1	0	11
2	0	11
3	0	11
4	1	9
5	0	11
6	0	12
15	0	12
16	0	10
Total	1	87

It will be seen that brightness dominates over form in this test, including pillars 15 and 16 where the figures on the pillars are coloured. To elucidate the last point, one may compare the results with those for pillars 7-14, 17 and 18, where there are colour differences, but next to no differences in brightness.

Pillar no.	Form	Brightness
7	0	10
8	1	8
9	2	4
10	1	7
11	1	6
12	1	5
13	2	4
14	1	6
17	3	3
18	2	4
Total	14	57

In a fifth (14) of the 71 answers, the experienced movement is determined by form, and in four fifths (57) by colour. In other words, when the selected figures as nearly as possible are of the same brightness, it becomes possible

to perceive movement determined by form, whereas the form cannot exert any influence when there are noticeable differences in brightness between the figures. Differences in form fail to have effect when a noticeable difference in brightness exists, irrespective of whether or not there are differences in colour as in the case of pillars 15 and 16.

Pillars 1-6, 15 and 16 can thus not be employed to show individual differences, as the influence of brightness overpowers the influence of form in all cases.

But it is possible to match the influence of form to that of colour, provided colours are chosen which deviate only slightly from each other in brightness.

As it is very difficult to obtain equal brightness using red and green lamps, and as Schmidt does not make any specific statement in this connection, it is to be assumed that he has not used colours of equal brightness, and his results are therefore difficult to explain. In Schmidt's experiment, the subjects perceived a rotating movement, as compared with the present experiments where the movement was upwards or downwards. But the type of movement makes little difference. Four subjects saw a rotating movement clearly determined by brightness when the present author fitted a circular disc provided with light and dark squares and circles to his apparatus, and moved it in the same way as the pillars.

An examination of Thurstone's film disclosed that there are such large differences in brightness between his figures, that it is impossible to think that they can be eliminated no matter how much one may alter the lamp in the projector.

Thus it seems probable that these two workers have concerned themselves with the effects of differences in brightness, although they assumed that the effects were derived from differences in colour. It appears necessary that one in future research keeps clearly in mind that brightness is so strongly dominant over form, that it is only possible to ascertain the influence of colour and form when one employs colours of the same brightness.

If one does so, individual differences can be ascertained, and the way is then open to investigate whether they agree to differences in the emotional behaviour of the subjects.

The investigation of the patients compared those who were calm with others who for years had been known to be unruly, who attacked other patients and who on any and every occasion reacted violently.

In the experiments with pillars 1-6, 15 and 16 where there were considerable differences in brightness, both groups of patients reacted similarly to the control group. Only 5 of the 25 patients perceived any movements

not determined by brightness differences, only one such movement being perceived by each of them.

In the experiments where there were only small brightness differences but large colour differences, there were some form-determined movements.

8 of the 11 calm patients manifested form reactions, but as such reactions were also found among the unruly patients (4 out of 9), the difference is so small, that one may hardly impute it any importance. In fact one may rather be surprised by the lack of an obvious difference in this respect, as such a difference ought to manifest itself if preference for colour in this type of test is related to the suddenness and strength of emotional reactions. The two groups of patients are as far apart as possible as regards their emotional reactions, but the difference between their results on the movement perception test is so small, that it may be assumed to be due to chance. This impression is confirmed, one might almost say proved, by examination of the reports for the individual experiments. For example, a patient from the calm patient group gave only colour reactions, while another patient from the excitable patient group reacted solely to differences in form where there were but small differences in brightness, i. e., the exact opposite result to what one would expect from the hypothesis which we are testing.

If we compare the results for the control group, the calm, the unruly patients, and those patients forming a central group between the two extremes, we find that the differences between these groups are so small, that there is no basis whatever for presuming any relationship between emotional reactions and colour-determined perceptions, using tests of the type described.

Pillar no.	Control group						Patients					
				calm			excitable			others		
	f	c	i	f	c	i	f	c	i	f	c	i
7	0	10	2	3	2	1	1	2	1	0	1	1
8	1	8	4	1	4	0	0	2	3	0	3	0
9	2	4	7	3	1	1	1	3	1	1	3	0
10	1	7	4	4	1	1	0	2	2	0	1	1
11	1	6	5	2	2	2	0	3	1	0	1	1
12	1	5	7	2	2	1	0	4	1	0	2	1
13	2	4	7	0	3	2	0	4	1	0	4	0
14	1	6	5	1	2	3	0	3	1	0	1	0
17	3	3	7	1	4	1	0	3	2	0	0	2
18	2	4	6	0	2	3	2	0	2	0	1	1
Total	14	57	54	17	23	15	4	26	15	0	17	7
	25 subjects			11 subjects			9 subjects			5 subjects		

The combined results are presented in the table on page 73. The figures give the number of subjects who reacted to form (*f*), to colour (*c*), and indeterminately (*i*) on the test concerned.

The group of excitable patients was expected to deviate from the other subjects in an obvious manner, and it will be noted that this group has fewer form reactions than the control group and the calm patients, but relatively more than the group 'other patients'. The number of colour reactions is not much larger than that for the control group, and neither is it particularly large when compared to the group of calm patients. If one after comparing the groups reads through the individual reports, it is clear why there is no definite difference between any of the groups investigated. After completion of the tests, it was impossible for the author to decide to which group a patient belonged on the basis of the movement perception tests alone. Likewise, it was impossible to differentiate between the control group and the patients.

The tests were consequently of no value for their original purpose. However, they uncovered the fact that brightness is of decisive importance in perception of movement when attempts are made to establish competition between colour and form, as differences in brightness can affect the perception of movement to such an extent, that differences in colour and form do not have any real influence on the results. In future research of this nature, one must therefore work with colours of equivalent brightness, as failing this, the results only express brightness effects, form and colour effects not appearing.

Investigations to be published elsewhere seem to demonstrate that experiments employing perceived relationship between colour and form, partly in lottery-like games, and partly in figures where the perceived relationships may be determined by either form or colour, are easier to administer, and lead to results that agree with characterological peculiarities.

#### SUMMARY

Experiments were carried out on stroboscopic movements in an attempt to find an explanation of the laws that must be assumed to govern the choice of form or colour in the Rorschach test. By means of a special apparatus the subjects were presented with visual stimuli that could occasion the perception of upward or downward movements. The movement perceived informed the experimenter as to whether form or colour dominated. The subjects comprised 25 students of psychology and 25 patients from psychiatric wards. The experiments gave only a few results that could elucidate the choice of colour or form on the Rorschach test, but disclosed a phenomenon that has hitherto been neglected: If competition is established between the perceptions of



movements based on a choice between colour and form, the form will determine the perceived movement if the figures differ but slightly in brightness. When there are considerable differences in brightness between the figures, the movement perceived will always be determined by brightness. The effect of differences in brightness may be ascertained using coloured as well as neutral grey figures.

#### REFERENCES

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### COMMUNICATIONS FROM THE INTERNATIONAL UNION OF SCIENTIFIC PSYCHOLOGY

#### THE UNION

The IUSP was officially organized at Stockholm in 1951, on the occasion of the 13th International Congress of Psychology. The principal officers elected on that occasion were Henri Piéron of France, President; Sir Frederik Bartlett of the United Kingdom, Vice-President; David Katz of Sweden, Treasurer; H. S. Langfeld of the United States, Secretary-General; and Jean Piaget of Switzerland, Assistant Secretary-General. The present officers, elected at Montreal in 1954, are Jean Piaget, President; Edgar Tranekjær Rasmussen of Denmark, Vice-President; Noël Mailloux of Canada, Treasurer; Otto Klineberg of the United States, Secretary-General; José Germain of Spain, Assistant Secretary-General.

The Union is an association of national psychological societies, of which 21 are now members, representing the following nations: Belgium, Brazil, Canada, Cuba, Denmark, Egypt, Finland, France, Germany, Great Britain, Holland, Israel, Italy, Japan, Norway, Spain, Sweden, Switzerland, United States, Uruguay, Yugoslavia.

It enjoys consultative status with UNESCO, from which it receives an annual subvention, through the Department of Social Sciences, as aid for administrative expenses, for meetings of the Executive Committee, for carrying out specific tasks entrusted to it by UNESCO, and to hold regional meetings and seminars to deal with such tasks and other relevant problems. One such meeting took place in Montreal on December 28 and 29, to discuss future activities of the Union in connection with (a) the scientific study of national characteristics, and (b) the origin and development of national stereotypes. Participants will include about a dozen Canadian and American psychologists. This represents the first meeting held under the auspices of a new Sub-committee on Research, consisting of Mailloux, H. C. J. Duijker of Holland, and Klineberg, with Piaget as a member ex-officio.

#### NEXT INTERNATIONAL CONGRESS

The next International Congress of Psychology (the 15th) will take place in Brussels, Belgium, from July 28 to August 3, 1957, under the presidency of Albert Michotte. The Congress is described as "Organized under the auspices of the International Union

of Scientific Psychology, by the Belgian Society of Psychology". A general organizing committee has been set up by the Belgians, under the chairmanship of Professor R. Nyssen, with M. Louis Delys as Secretary-General. A Program Committee, and a Local Arrangements Committee, have also been constituted. The Congress address is: 296, avenue des Sept-Bonnières, Forest-Brussels, Belgium. In order to assure close cooperation with the Belgians in preparing for the Congress, the Union has established a special Congress Committee consisting of Piaget, Piéron, Mailloux and Klineberg.

#### RELATIONS WITH INTERNATIONAL COUNCILS

The Union has applied for membership in the *International Council of Scientific Unions* (ICSU), but so far, for a variety of reasons, the application has not been accepted. On the latest occasion, at a meeting in Oslo during August, 1955, Piéron again presented the application, with a brief summary of the scientific character and accomplishments of psychology. The Executive Committee of ICSU, at its meeting on August 6, decided not to recommend the admission of the Union, but the question was re-opened at a meeting of the General Assembly the following day. Piéron again presented the case for admission of the Union, which this time was warmly supported by several of the delegates. Finally a resolution was adopted which postponed a final decision, but invited the International Union of Biological Sciences to organize a committee representing the Biological Sciences, Physiology, Mathematics, and Pure and Applied Physics, to prepare a report for the next session of the Executive Committee, on the place that Scientific Psychology might occupy in the organization of ICSU.

In the meantime, psychology is represented in ICSU through the recent establishment of a section on Experimental Psychology and Animal Behaviour in the Division of Biology of the IUBS, which is a part of ICSU. The initiative, for this action was taken by H. S. Langfeld, and supported by the psychological associations of Canada, France, Holland, Japan, Spain, Switzerland, the United Kingdom, the United States, and Uruguay. The officers of this Section, nominated by the Executive Committee of the International Union of Scientific Psychology, are as follows:

**President:**

Henri Piéron, Institut de Psychologie, Paris.

**Vice-Presidents:**

Clarence Graham, Columbia University,

J. Piaget, University of Geneva,

Sir Frederick Bartlett, Cambridge University,

H. S. Langfeld, Princeton University.

**Secretary General:**

D. O. Hebb, McGill University.

**Executive Secretary:**

Dr. Ubeda, Institute "Luis Vives" de Filosofía, Avenida General Mola, 29, Madrid.

**Members:**

F. J. J. Buytendijk, University of Utrecht,

Shiro Morinaga, Chiba National University, Chiba, Japan.

The Union has been associated with the *International Social Science Council* since its formation in 1952; the present members of the Council representing psychology are Piaget and Klineberg.